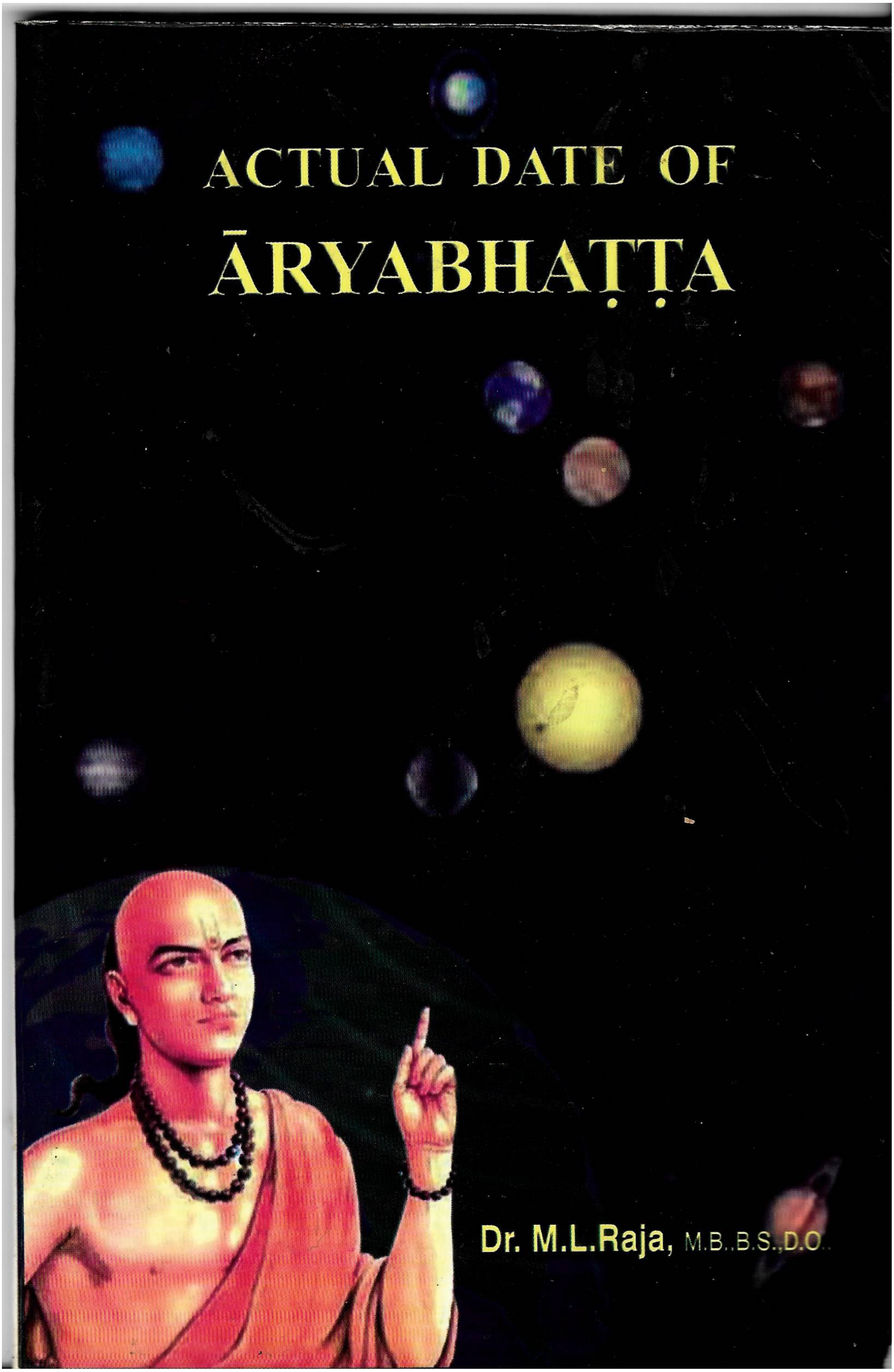
ACTUAL DATE OF ĀRYABHAṬṬA



Dr. M.L.Raja, M.B.,B.S.,D.O.

GREAT ANCIENT BHARATIAN
ASTRONOMERS AND MATHEMATICIANS
BOOK - 1

ACTUAL DATE OF
ĀRYABHAṬṬA

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A WORD IN APPRECIATION

I have gone through the thought provoking work titled "The actual date of Aryabhatta" written by Dr.M.L.Raja, M.B.,B.S.,D.O., Director of AVINASH, Tamilnadu. Doctor has done research about the date of Aryabhatta. He quotes a sloka from Aryabhattiyam. There are two readings one is षष्ट्यब्दानां षड्भिः (Shadbhih) and the other is षष्ट्यब्दानां षष्टिः (Shashtih). He extensively explains, quoting grammar rules on the word formation of व्यतीताः (were elapsed excessively). In his opinion, the actual date of Aryabhatta is B.C.2764. The author of the work Dr.Raja concludes - "It is proved absolutely that "Shadbhih" (षड्भिः) is the correct word and not "Shashtih" (षष्टिः) grammatically and syntactically. Thus 2764 B.C.E. is the date of Aryabhatta."

Dr.Raja also cites other sources of evidence for his opinion such as Laghu Bhaskareeyam of Bhaskara (522/629 C.E.) and Pancha Siddhantika of Varahamihira etc. Thus, the work can be taken as a good and authentic Research paper on the actual date of Aryabhatta. Dr.Raja deserves congratulations in taking pain in bringing truth about Aryabhatta.

I expect more such research works in the field of scientific heritage of Bharat.

आर. वासुदेवन्. पोट्टि 6-6-2011

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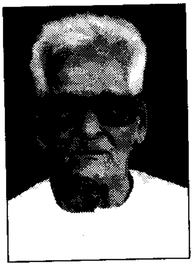

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PREFACE

In the history of our Nation, we can find thousands and thousands of great scholars and their works, in almost all fields of science. We can site examples, at least a few hundred in each century, scattering over a very long period of time, exceeding a minimum of ten thousand years. Their works in the various fields of science are remarkably outstanding, highly astonishing and fully scientific with thorough and clear knowledge, exceeding the modern scientific achievements, at lest in a few aspects.

But, the most unfortunate thing is, we are very much ignorant of our ancestor's glorious antiquity, Himalayan achievements, high technological skill and the vast knowledge and wisdom and their highly admirable scientific works are not at all included in our Nation's educational curriculum. So, it is right time or even if late, it is better late than never, to bring forth these ancient scientific works of our glorious Nation, in the daylight, amongst the present and the future generations of our Nation.

With that motive in mind, this book on Āryabhaṭṭa is a very small, but a firm step in that direction, where the actual date and name of Āryabhaṭṭa and his texts are detailed. On reading these types of works, revealing the true vision of our ancestor's knowledge, we as a Nation, will definitely feel much proud of our heritage and our self confidence will be highly boosted. With that, our Nation's scientific achievements will again reach its Himalayan peak, as in the ancient days. Further, whenever our Nation takes the lead in the scientific field, we can find that the science is totally Dharma based and is for the betterment of not only the Human society, but also for the whole animate and inanimate, in contrast to the selfish and self destructive western concept of science. Thus, the Dharma based and all encompassing Bhāratian concept of science is the need of the hour, which can lead and guide the whole world, in peaceful co-existence with prosperity and humanity, to prevent the total annihilation of the human race, which is almost on the verge, a fate came out of the western concept of science and living.

Thus, Dr. Arnold Joseph Toynbee, the British Historian (1889-1975), mentioned firmly, "It is already becoming clear that a chapter which had a Western beginning will have to have an Indian ending, if it is, not to end in the self-destruction of the human race. At this supremely dangerous moment in human history, the only way of salvation for mankind is the Indian way."

I humbly submit my pranāms to my Guru Śrī Prof. Vasudevan Potti, Retd. Professor of Vedānta, who guided me in writing this book with correct Sanskrit Grammatical analysis. It is a great honour to me to have his highly valuable opinion on this book and the same is given as the Foreword for the book. I sincerely express my heartfelt thanks to the publishers and the printers for bringing out the book in an excellent and elegant manner.

Erode
23-05-2011 Dr. M.L.Raja

DIACRITICAL MARKS FOR ROMAN TRANSLITERATION OF DEVANAGARI SCRIPT

1. Short Vowels

अ - A, a   इ - I(E), i   उ - U, u   ऋ - Ṟ, ṟ   ऌ - ḷ

2. Long Vowels

आ - Ā, ā   ई - Ī, ī(ē)   ऊ - Ū, ū   ए - E, e   ओ - O, o

ऐ - Ai, ai   औ - Au, au   अं - ँ   : - Ḥ, ḥ

3. Non-aspirant - ऽ

4. Consonents

क - K, k   ख - Kh, kh   ग - G, g   घ - Gh, gh   ङ - Ń, ń

च - C, c   छ - Ch, ch   ज - J, j   झ - Jh, jh   ञ - Ñ, ñ

ट - Ṭ, ṭ   ठ - Ṭh, ṭh   ड - Ḍ, ḍ   ढ - Ḍh, ḍh   ण - N̲, n̲

त - T, t   थ - Th, th   द - D, d   ध - Dh, dh   न - N, n

प - P, p   फ - Ph, ph   ब - B, b   भ - Bh, bh   म -M, m

य - Y, y   र - R, r   ल - L, l   व - V, v

श - Ś, ś   ष - Ṣ, ṣ   स - S, s ,ह - H, h

5. Compound letters - क्ष - Kṣ, kṣ   ज्ञ - Jñ, jñ   त्र - Tr, tr

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ĀRYABHAṬṬA

HIS ACTUAL DATE

Āryabhaṭṭa occupies a prestigious position in the history of Bhāratian astronomy and mathematics. Our Nation's first satellite, put into orbit on 19th April 1975, was named after him. His contributions in the field of astronomy and mathematics, at the very ancient period itself, is of great value even to-day. The following ancient śloka correctly expressed the greatness of Āryabhaṭṭa as, [1]

सिद्धान्त पञ्चक विधावपि दृग्विरुद्ध मौढयः
उपरागमुखखेचर चारक्लृप्तौ ।
सूर्यः स्वयं कुसुमपुर्य भवत् कलौ तु भूगोलवित्
कुलप आर्यभट्टाभिधानः ।।

Siddhānta pañcaka vidhāvapi dr̲ugviruddha mauḍhaya:
uparāgamukhakhecara cārakḷptau ।

Sūrya: Svayam Kusumapurya bhavat Kalau tu
Bhūgolavit Kulapa Āryabhaṭṭābhidhāna: ।।

The meaning is that when the methods of the Five Siddhānta (Pañca Siddhāntā: namely Vāśiṣta, Saura (Sūrya), Paitāmaha, Romaka (Lomaka) and Pauliśa) began to yield results which are inconsistent with the observed phenomenon, in the setting of the Graha, eclipses etc., there appeared the Sun God, 'Sūrya' himself, as Āryabhaṭṭa, the Kulapa (the head of a University or a family or a village or a section of the society) who was well versed in Astronomy, at Kusumapura, in the Kaliyuga.

Even his name Āryabhaṭṭa itself shows his greatness, where 'Ārya' means honourable and esteemed person and 'Bhaṭṭa' denotes a learned man and a philosopher. Actually, Pañca Siddhāntikā of Varāhamihira, the Text edited with Sanskrit commentary and English translation by G.Thibaut and M.M.Sudhakara Dvivedi, (Chowkhamba Sanskrit Series Office, Varanasi, 1968) in the page 45 at the 20th śloka of 15th Adhyāya: (Jyautiṣopaniṣad), mentions his name as Āryabhaṭṭa in the left hand column text.[2] But, the text given in the in the right hand column mentioned it as Āryabhaṭa. On this discrepancy, G.Thibaut mentioned clearly in his preface to this book,[2] written on 15th December 1888, "The right hand columns of the text, give the 'emended' text; the left hand columns, the text of the better one of our two Manuscripts, which we thought advisable to exhibit in extenso." Scanned copies of these pages are given at the end of the book. Thus, the manuscript mentioned the name as Āryabhaṭṭa but G.Thibaut and others altered it as Āryabhaṭa.[2] This is totally unjustifiable and unwanted. Thus, these orientalists or the oriental experts, as they call themselves, willfully misspelt it as Āryabhaṭa, where 'Bhaṭa' means a mercenary, a hired soldier, slave, uncivilized person, demon, servant or warrior. Obviously one can say, it is totally irrelevant and wrong, to what was read about Āryabhaṭṭa, as a great astronomer and mathematician and not as a mercenary or the rest. In spite of this, it was done willfully to mislead and misguide us, on the ancient greatness of our Nation and thereby to seed inferiority complex in our minds.

ĀRYABHAṬṬA'S TIME

Āryabhaṭṭa mentioned his date in the 10th śloka of the 3rd Adhyāya: (Kālakriyā pāda:) of Āryabhaṭṭīyam as, [3]

षष्ट्यब्दानां षड्भिर्यदा व्यतीतास्त्रयश्च युगपादाः ।
त्र्यधिका विंशतिरब्दास्तदेव मम जन्मनोऽतीताः ।।

Ṣaṣṭyabdānām Ṣaḍbhiryadā vyatītāstrayaśca
yugapādā: ।
Tryadhikā vimśatirabdāstadeva mama
janmanoऽtītā: ।।

Meaning: 1. Ṣaṣṭi: - Sixty, 2. Abdānām - Of the years (sixth [genitive] case), 3. Ṣaṣṭyabdānām - Of sixty years, 4. Ṣaḍbhi: - By Sixes (third [instrumental] case of six – always plural in Sanskrit), 5. Yadā - When, 6. Vyatītā: - Were elapsed excessively, 7. Traya: - Threes (3 – first [nominative] case, masculine – always plural in Sanskrit, 8.Yugapādā: - One part of Mahāyuga, 9.Tri - Three, 10.Adhika - Excess, 11. Vimśati: - Twenty, 12. Abdā: - Years, i.e.

Tryadhikā vimśatirabdā: - 23 years, 13. Tadā - At that time, 14. Mama - My, 15. Janmana: - Since birth (fifth case of Janman – Birth), 16. Atītā: - Were elapsed.

"When, all the three parts of Yuga were elapsed excessively, by sixes of sixty years, then 23 years were elapsed since my birth" is the meaning of this śloka. In the present 28th Mahāyuga, when all the three parts of Yuga namely Kṟta (Satya), Tretā, Dvāpara (3 x 1 = 3 parts in total) had been excessively elapsed, by three hundred and sixty years (360 - sixes of sixty years) of the present Kaliyuga, Āryabhaṭṭa wrote this Āryabhaṭṭīyam and at that time, he was 23 years old is the conclusion of this śloka.

ĀRYABHAṬṬA WAS BORN IN 337 KALI (2764 B.C.E.)

Thus, Āryabhaṭṭa, in Three Hundred and Sixty (360) Kaliyugābdam, at the age of 23, wrote Āryabhaṭṭīyam. Therefore, he was born in Three Hundred and Thirty Seven (337) Kali (360 – 23). The present year (Vikruti -2011 C.E.) is 5112 Kali. So Kali 337 means, 4774 (5111 – 337) years before present. Therefore, Āryabhaṭṭa was born, 4774 years before present. He wrote Āryabhaṭṭīyam at his 23rd year of age. Thus, Āryabhaṭṭīyam was written 4751 years (4774 – 23) before present. Hence, the date of Āryabhaṭṭa is 2764 B.C.E. [4774 – 2010] and Āryabhaṭṭīyam was written in 2741 B.C.E. [4751 –2010]. Thus, Āryabhaṭṭa mentioned his period, very clearly with no room for doubts.

However, in the late 18th and the 19th century C.E., some of the Europeans, they themselves on their own, wrongfully took full control of oriental research and made unilateral decisions on oriental matters. Most of them had their own problems in accepting this date of Āryabhaṭṭa, due to the following two reasons. The first reason is their greedy ambition to rule and loot our Nation, forever. Therefore, they carried out well-planned activities, to seed inferiority complex in our people's mind. In this regard, one of their activities was to reduce our antiquity and damage our glorious ancient achievements, by tampering, meddling, interpolating, misinterpreting, misreading and destroying our ancient Scriptures, literature, scientific texts, inscriptions, stone engravings and archeological evidences, besides the act of hiding the real and creating forgeries.

The second reason is their fundamental belief, as per the decree of Ireland Arch Bishop Usher (1664 C.E.), that the world was created by God at 9 A.M. on 23-10-4004 B.C.E. and this is just 6014 years (4004 + 2010) before present. From this period, one has to allot at least 1500 to 2000 years for Ice Age and the Age of Great deluge. So, according to their belief, the beginning of the human history could not be extended beyond 4000 to 4500 years before present (2000 to 2500 B.C.E.). If done, it will totally shatter their fundamental belief. Hence, these Europeans started tampering and altering our ancient texts to reduce our antiquity. Accordingly, the above-mentioned śloka of Āryabhaṭṭīyam was also tampered by them, since it mentions the date of Āryabhaṭṭa as 2764 B.C.E., prior to this 2000 to 2500 B.C.E.

THE UNSCRUPULOUS MISDEED

Thus, these Europeans unjustifiably altered this śloka and with that alteration made, they maintained that Āryabhaṭṭa was born, just 1534 years (2010 – 1534 = 476 C.E.) before present. They altered the words, 'Ṣaṣṭyabdānām Ṣaḍbhiryadā' (by sixes of sixty years = 360) into 'Ṣaṣṭyabdānām Ṣaṣṭiryadā' (sixties of sixty years = 3600). This is unwanted, unjustifiable and unholy act. Thus, 360 years of Kali was altered into 3600 years of Kali. Here the word with the meaning, by Six (Ṣaḍbhi:), was changed into the word with the meaning Sixty (Ṣaṣṭi:) by them. It is a small change and the number of letters is same. Hence, the Ārya meter (Chandas) has not been affected, but the meaning was changed to a great extent. Thus,

षष्ट्यब्दानां षड्भिर्यदा व्यतीतास्त्रयश्च युगपादाः ।

is altered into

षष्ट्यब्दानां षष्टिर्यदा व्यतीतास्त्रयश्च युगपादाः ।

All the manuscripts and the books printed of Āryabhaṭṭīyam and its commentaries were altered perfectly and secretly in a well-planned manner. During this period of alteration, the Europeans were at the helm of power. Besides, the Directors and Curators of the various Oriental and other Libraries of our Nation, including princely states, were British and their followers only. Thus, it was easier for them to carry out the change in all the manuscripts and texts, when they were recopied, as a routine regularity. Besides, the colonial government systematically collected large numbers of manuscripts and deposited in Asiatic Society and Govt. Oriental Libraries. These libraries were under the control of British officers. Further, most of the manuscripts were sent to Europe. The manuscripts at Europe are still larger than what are available here. These manuscripts belong to our Nation only and are our property. Then, why they have been insidiously transported to Europe and still not handed back to us, even after 63 years of Independence? Is it not with the motive of, 1. Understanding the knowledge in them and then falsely owning them as their own knowledge and 2. Altering the letters of important sentences in these manuscripts so as to proclaim that they are post Greek in chronology and then to mislead the world that our ancestors acquired knowledge from Greek?

Though they were not having any right or justification to alter and tamper our Nation's ancient manuscripts, they have done it to fulfill their hidden greedy ambition. Thus, for example, in the following texts, it was printed as Ṣaṣṭiḥ only, in the first sentence of this 3-10 śloka. 1. The Āryabhaṭīya with the commentary of Bhaṭadīpikā of Paramādīśvara, edited by Dr.H.Kern,[4] 2. The Āryabhaṭīya of Āryabhaṭācārya with the commentary of Nīlakaṇṭhasomasutvan, Part 2 Kālakriyāpādaḥ, edited by K.Sāmbaśiva Śāstrī,[5] 3. Āryabhaṭīya of Āryabhaṭa, edited by K.S.Sukla and K.V.Sarma,[6] 4. Āryabhaṭīya of Āryabhaṭa with the commentary of Bhāskara 1 and Someśvara, edited by K.S.Sukla,[7] and 5. Āryabhaṭīya of Āryabhaṭa with the commentary of Sūryadeva Yajvan, edited by K.V.Sarma.[8] All these texts show Ṣaṣṭiḥ in the first sentence of the 3-10 śloka and it is shown below, exactly as mentioned in all these texts.

षष्ट्यब्दानां षष्टिर्यदा व्यतीतास्त्रयश्च युगपादाः ।
त्र्यधिका विंशतिरब्दास्तदेह मम जन्मनोऽतीताः ॥

Ṣaṣṭyabdānām Ṣaṣṭiryadā vyatītāstrayaśca
yugapādā: ।

Tryadhikā vimśatirabdāstadeha mama
janmanoऽtītā: ॥

Thus, by way of tampering this śloka of Āryabhaṭṭīyam, Āryabhaṭṭa who was born 4774 years ago was pushed towards the modern period by 3240 years (4774 – 1534). Is it not a great conspiracy committed against our Motherland?

MISDEED CONTINUES

However, these Europeans have not stopped their misdeed, at this level alone. After reducing Āryabhaṭṭa's antiquity by 3240 years, to a much later period than Ptolemy et al, they started writing in all possible ways that Āryabhaṭṭa and the other ancient astronomers of our Nation, borrowed their astronomical knowledge from the Greek. They are quoting Aristarchus (310-230 B.C.E.) of Samos, Hipparchus (190-120 B.C.E.),[9] Herakleides (≈ 350 B.C.E.) of Pontus, Ecphantus and Claudius Ptolemy (≈150 C.E.) of Alexandria in Egypt, from whom our ancestors were said to have learned Astronomy. But the actual fact is that the Greek learned astronomy from the very much ancient Sūrya Siddhānta:, 4751 years old Āryabhaṭṭīyam, 2133 years old Varāhamihira's Pañca Siddhāntikā and the much older 18 Astonomical Siddhāntā: of our Nation. The Greek got access to these astronomical texts and knowledge, through the international trade of our Merchants, cultural travels of our Saints and through Alexander's and other Greek army's greedy march towards Bhārat.

If the Greek had any good astronomical knowledge and skill on their own, then there would have been a chain of astronomers, spreading in all centuries, in its history also, as that of Bhārat. However, the fact is, we can find only a few astronomers, as mentioned earlier and no astronomical texts of Greek, has been found in its full form in the history of the Greek. Only a few references and quotations were present in the books of latter period and beyond that, we could find nothing. However, these pieces of references quoting the names of the texts with a little astronomy are praised and referred as the great astronomical works of Greek. On the contrary, we can mention hundreds of astronomers, right from Āryabhaṭṭa, down to 18th and 19th Century C.E., spreading in all centuries and hundreds of astronomical texts of these astronomers, in the history of Bhārat. Further, Dr.V.P.Dalal of Heidelburg University of Germany, a mathematician, physicist and a Sanskrit scholar mentioned,[10] "It shows how deeply the ancient Indian Mathematicians penetrated, in the subtlety of their calculations, even when the Greek had no numerals above 1000 (thousand) and their (Greek's) multiplication were so very complex, which they performed with the help of counting frames, by adding so many times the multiplier."

One can understand without the numbers beyond thousand and multiplication in Mathematics, no body can master astronomy. Thus two thousand years before, the maximum number, the Greek knew was 1000 (Myriad) and in the case of Roman, it was Millie. Not only the Greek, but also the Roman and thereby the Europeans knew the numbers up to 1000 only. That is why in their language, they have separate single words for the numbers one, ten, hundred and up to thousand only. In the latter period, when they came to know the numbers more than thousand, they found that there were no words for them in their language. So they combined the words of numbers

One, Ten, Hundred and Thousand and coined new words for the numbers 10,000; 1,00,000 etc. Thus, they combined the two words ten and thousand, for Ten thousand (ayutam) and the words hundred and thousand for One lakh. For Ten lakhs (prayutam), the word Millie representing 1000 in Roman, was changed into million and combined with the word one. For One crore, words ten and million were combined. From Million onwards they combined bi meaning two, tri meaning three, to form billion, trillion etc.

However, in our Nation, we have separate words for the numbers up to 10^{12} (One trillion), even at the period of Yajurveda itself. YajurVeda Samhitā in its 2nd Mantra: of the 17th Adhyāya:[11] reveals the geometric progression of numbers from one, ten, hundred, thousand etc., up to 10^{12} (one trillion) as,

इमा मे अग्न इष्टका धेनवः सन्त्वेका च
दश च, दश च शतं च, शतं च सहस्रं च,
सहस्रं चायुतं चायुतं च नियुतं च, नियुतं च
प्रयुतं चार्बुदं च, न्यर्बुदं च, समुद्रश्च, मध्यं
चान्तश्च, परार्धश्चैता मे अग्न इष्टका धेनवः
सन्त्वमुत्रामुष्मिँल्लोके ।।

Imā me Agna iṣṭakā Dhenavaḥ Santv Ekā ca daśa ca, Daśa ca śatam ca, Śatam ca sahasram ca, Sahasram ca ayutam ca, Ayutam ca niyutam ca, Niyutam ca, Prayutam ca, Arbudam ca, Nyarbudam ca, Samudraśca, Madhyamca, Antaśca, Parārdhaścaitā Me Agna iṣṭakā Dhenava Santvamutrāmuṣmiṅlloke ||

Parārdha is the word [11] for the number, one lakh crores (1,00,000,00,00,000 - one trillion -10^{12}).

Srīmad Rāmāyanam, written by Vālmīki, the first literature of the world, mentions [12] the numbers starting from 100 to 10^{62} in the 33 to 42 śloka of 28th Sarga: of the Uddhakāṇḍaṃ. महौघ (Mahaugha)[12] is the word for the number 10^{62} (10 Lakh Crore Crore Crore Crore Crore Crore Crore Crore).

Further, we cannot do multiplication using the Roman Numeral Signs. For example, multiplying XIII by VIII is not at all possible, where as, it will be easier to multiply 13 x 8, because here the numerical signs are having both the absolute value and the place value. For example "48" is the number sign (symbol) of the number 48, where the sign "4" has the absolute value as 4, the place value as 10 (10th place) and thus the total value as 40 (4 x10). Further, these 48, 13, 8 and other decimal number system and the numerical signs are not of Arabic Origin, but of Bhāration origin indeed. From Bhārat it went to middle Asia, Arab and from there it reached Europe. A.D.Alexandrov correctly remarked this,[13] as "What the Greek genius could not attain, i.e. to give the most convenient notation of numbers, to extend the system of numbers and to abstract irrational numbers from their geometrical base – all were done in India and reached Europe through middle Asia and Arab." Further Laplace [14] put it correctly, "It is India, that gave us the ingenious method of expressing all numbers in ten symbols, each receiving a value of position as well as an absolute value, which escaped the genius of Archimedas and Apollonius of Greek."

Now one can be very definite, from whom, who has learned astronomy, mathematics etc. But, after reducing the antiquity of Āryabhaṭṭa, these Europeans started claiming that Āryabhaṭṭa learned astronomy and mathematics from Greek.

TRUTH ALONE TRIUMPHS

Now, we can show the internal evidence of Āryabhaṭṭīyam which totally disproves these European's assumed date of 476 C.E., for Āryabhaṭṭa. In the 3rd śloka of the 1st Adhyāya: (Gītika Pāda:) of Āryabhaṭṭīyam, Āryabhaṭṭa mentioned [15] that in one Mahāyuga of 43,20,000 years, the Earth rotates itself on its own axis 158,22,37,500 times and the moon revolves round 5,77,53,336 times. So, Āryabhaṭṭa mentioned that 158,22,37,500 rotations of the Earth are equal to 5,77,53,336 lunar orbits, in terms of time. So the number of rotations of the Earth per Lunar orbit is 27.39646936 (158,22,37,500 ÷ 5,77,53,336), at Āryabhaṭṭa's period. According to the Astronomical formulas and constants (www.jqjacobs.net/astro/aryabhata.html)[16] that the value of this ratio at 2000 C.E. is 27.39646289, for 500 C.E., it is 27.39646514 and for 1604 B.C.E., it is 27.39646936.

2000 C.E. - 27.39646289
500 C.E. - 27.39646514
1604 B.C.E. - 27.39646936
Āryabhaṭṭa's Value - 27.39646936

We can find that this value reduces, on the advancement of time and Āryabhaṭṭa's value differes much from that of 500 C.E. This disproves 476 C.E. as the date of Āryabhaṭṭa.

Besides, the number of days per lunar orbit,[15] according to Āryabhaṭṭīyam is 27.32166848. [(158,22,37,500 – 43,20,000 =) 157,79,17,500 ÷ 5,77,53,336]. This value[16] for 2000 C.E. is 27.32166080, for 500 C.E., it is 27.32166380 and for 1604 B.C.E., 27.32166801.

2000 C.E - 27.32166080
500 C.E. - 27.32166380
1604 B.C.E. - 27.32166801
Āryabhaṭṭa's Value - 27.32166848

Here also the value decreases, as the time advances and Āryabhaṭa's value denotes a period, prior to 1604 B.C.E., rather than that of 500 C.E. So Āryabhaṭṭa's date is definitely not 476 C.E.

Fortunately, these Europeans and their followers in our Nation, who has shown them, the access to the knowledge treasure of our Nation, did not know the Sanskrit Grammar, in a complete thorough manner. Thus, on tampering the above mentioned śloka of Āryabhaṭṭīyam (3 -10), they can alter only with grammatical error. Due to this, their misdeed is now correctly exposed. We have to thank sincerely and to show our gratitude to the great patriotic Sanskrit scholars of our Nation, who correctly exposed it. This can be clearly shown by the grammatical analysis of the word "Vyatītāḥ" which denotes action in the first sentence of this 3-10 śloka of Āryabhaṭṭīyam.

Vyatītāḥ (व्यतीताः)

'Vyatīta' is the word denoting action in this sentence (3-10 śloka). It is a Past Passive Participle word denoting past tense and shows that the sentence is in passive voice. The word Vyatīta is Vi + Ati + E + Ta (वि + अति + इ [ण्]+ त). Vi + Ati (वि + अति) = Vyati (व्यति - Yan̲ Sandhiḥ), Vyati + E [इ (ण्)] = Vyatī (व्यती Dīrga Sandhiḥ), Vyatī + Ta (त) = Vyatīta (व्यतीत). The Plural, Masculine word of 'Vyatīta' in the first (nominative) case is "Vyatītāḥ" (व्यतीताः - like Rāmaḥ Śabdaḥ). "Vi (वि)" is Indeclinable Preposition - Prādaya - Avyaya - Upasargaḥ. "Ati (अति)" is another Upasargaḥ, with the meaning ‘Over, Beyond, Overstep’. In Sanskrit Language, more than one Upasargaḥ can join a single verb. “E - इ - इ(ण्)” is the verb with the meaning of elapse, cross, overtake, go, advance and leave behind. The exact meaning will depend on the Upasargaḥ joined with it and the nature of the sentence.

“Ta (त)” is the affix at the end and is the most important one. “Ta” is Kṟidantaḥ (कृदन्तः) suffix of “Niṣṭhāḥ” (निष्ठाः) type. There are two suffixes in Niṣṭhāḥ type. They are “Ta (त)” and “Tavat (तवत्)”. Pāṉini denotes them as “kta” and “ktavatū” as both will not undergo Guṉa and Vṟddhi changes. (क्तक्तवतू निष्ठा Pāṉini 1-1-26). Both denote Past Tense (निष्ठा { भूते } Pāṉini 3-2-102). But, Ta (त) denotes object (Karman – कर्मन्) on whom or on which the action was done or in the intransitive sentences, the action (Bhāva - भाव), as per Pāṉini’s Aṣṭādhyāyī 3 – 4 - 69 and 70 Sūtra and hence is Karma Niṣṭhāḥ. Hence the sentence will be in Passive Voice. Tavat (तवत्) denotes the agent (Kartṟ - कर्तृ) who or which did the action and hence is Kartṟ Niṣṭhāḥ. Hence the sentence will be in Active Voice. These are shown by Pāṉini’s Aṣṭādhyāyī 3 – 4 - 69 and 70 Sūtra as follows.

“लः कर्मणि च भावे चाकर्मकेभ्यः
(Laḥ karmaṉi ca bhāve ca akarmakebhyaḥ)” 3-4-69

“तयोरेव कृत्यक्तखलर्थाः
(Tayoreva [Tayo: Eva] kṟtya kta khalarthāḥ)” 3-4-70

Thus the Ten Lakārāḥ (Lut, Lit, Lut to Lṟt) denotes the object (karmaṉī) or the agent (Kartṟ – as denoted by "ca") in Transitive Sentences and in Intransitive Sentences (Akarmaka), the action (Bhāva) or the Agent (as denoted by "ca") (3-4-69); But, in the sentences with kṟtya (कृत्य) and kta (क्त – त) affixes and with words meaning khal (खल्), denote only (Eva) the object or action (Tayo: - Of those two). Thus, they will not denote agent. Hence, these sentences will be in Passive voice only and not in Active voice. Thus, "Ta (kta)" is Past Passive Participle suffix. Since, this sentence is in passive voice, the "ta" suffixed word denoting action, should agree in number, gender and case with the object (Karmaṉī) only and not with the agent (Kartṟ). Besides, the object will be in first (Nominative) case and the agent who did the action, will be in third (Instrumental) case.

There are four exceptions to this, where the sentence will be either in passive or in active voice. They were mentioned by Pāṉini's Astādhyāyī in 3-4-71 and 72 Sūtra. Accordingly, when it denotes, 1. The beginning of an action (आदिकर्मणि क्तः कर्तरि च Pāṉini 3-4-71), 2. With the words meaning motion (गत्यर्थ [गति +अर्थ] – the physical motion as mentioned in Aṣṭādhyāyī of Pāṉini by Śrīśa Chandra Vasu, Volume 1 page 281, (Motilal Banarsidass) as an explanation to Pāṉini 2-3-12 and गत्यर्थ – To come, To go, To start &c – Ibid., Volume 2 page 1517 as a translation of the Pāṉini 8-1-51, 3. In intransitive sentences (अकर्मक) and 4. When joined with verbs Śliṣ (to embrace), Śī (to lie down), Sthā (to stand), Ās (to sit), Vas (to dwell), Jan (to produce), Ruh (to mount) and Jṟi (to grow old) [2, 3 and 4 - the Pāṉini 3-4-72], the "Ta" suffix denotes either the agent or object (as denoted by ca (च) in both these 3-4-71 and 72 Sūtra). Thus, only in these four exceptions, the sentence with "Ta" suffixed word denotes either the agent or the object. In all the other, it will denote object or action only and thus, the sentence will only be in passive voice. Besides, in all these four exceptions also, the sentence with "Ta" suffix can be in passive voice, denoting object. In this 3-10 śloka, the word "Vyatītāḥ" with "Ta" suffix, 1. Does not denote the beginning of an action, 2. The meaning of Vyatītāḥ is 'were elapsed [17] excessively' and hence it does not give the meaning of physical motion. Besides the word Gati (गति) does not have the meaning of elapse or elapsed, 3. This sentence has the object Yugapādāḥ (युगपादाः) and hence it is a transitive sentence. Besides, the word 'elapsed' is transitive as it shows that something was elapsed by some other thing. Further, when Upasargaḥ is added to verbs, they become transitive and 4. The verbs like "Śliṣ" are not there in this sentence of 3-10 śloka. Hence these four exceptions can not be applied to this sentence. Hence this sentence of 3-10 śloka is in passive voice only and not in active voice.

Pāṉini's Aṣṭādhyāyī 3-2-187 and 3-2-188 Sūtra, mentioned that "Ta (त)" suffix denotes present tense, 1. In sentences with verbal roots ñi (ञि, 3-2-187) and 2. With the verbal roots meaning

Inclination, Understanding and Respect (3-2-188). But this sentence of 3-10 śloka, do not have these verbal roots and hence it denotes past tense only.

PAST PASSIVE VOICE

Thus, the word "Vyatītāḥ" (व्यतीताः) with the "Ta (त)" suffix, in this sentence of 3-10 śloka of Āryabhaṭṭīyam, denotes that the sentence is in passive voice and is in past tense. Since it is in passive voice, the word denoting action should be in accordance, in Number, Gender and Case, only with the object, on which the action was done. Here the word denoting action (with Kṛdantaḥ कृदन्तः - Niṣṭhā निष्ठाः suffix "Ta - त ") is "Vyatītāḥ" which is in Plural, Masculine Gender and in First (Nominative) Case like Rāmaḥ Śabdaḥ. Thus, it shows that the object will be in Plural, Masculine and Nominative Case. In this sentence of 3-10 śloka, the object Yugapādāḥ (युगपादाः) is correctly in Plural, Masculine and Nominative Case. Besides, the agent (Kartṛ - कर्तृ) should be in Third (Instrumental) Case, as it is a passive voice sentence. Thus, the word Saḍbhi which is in third (Instrumental) case is correct and the word Saṣṭiḥ which is in first (Nominative) case is not correct, grammatically and syntactically.

Thus, in the first sentence of 3-10 śloka 1. The word Trayaśca Yugapādāḥ (all the three parts of Yuga) is the object and is in plural, masculine and first case, 2. The word Vyatītāḥ (were elapsed [17] excessively) is the word denoting action and is in plural, masculine and first case and 3. Ṣaṣṭyabdānām Ṣaḏbhiḥ (by sixes of sixty years) is the agent doing action and is in third instrumental case, as it is passive voice. In the object, Trayaśca Yugapādāḥ (all the three parts of Yuga), the word "Trayaśca" denotes all the three parts. Here, the word ca (च) was added to Trayaḥ, so as to denote all the three parts of yuga. (Trayaḥ – त्रयः = Three – त्रयः + च = त्रयश्च – visarga sandhiḥ). Thus, ca (च) was added here with that purpose only and hence was written after Trayaḥ only and not after Yugapādāḥ. In the agent, Ṣaṣṭyabdānām Ṣaḏbhiḥ (by sixes of sixty years), the word "Ṣaṣṭyabdānām" denotes, indicates and qualifies which "sixes" did the action of elapsing excessively. Thus, Ṣaṣṭyabdānām (of sixty years) is the qualifying word - Viśeṣaṉam (विशेषणम्) and "Ṣaḏbhi (by sixes)" is the word qualified by it - Viśeṣyam (विशेष्यम्). This is like "Rūpyakāṉām Ṣaḏbhiḥ" (रूप्यकाणां षड्भिः). Here Viśeṣaṉam is in the sixth (Genitive) case and it need not agree with Viśeṣyam, in the cases of the nouns (विभक्तिः). This is Ṣaṣṭhīvibhaktyantam Vyadhikaraṉa Viśeṣaṉam (षष्ठीविभक्त्यन्तं व्यधिकरण विशेषणम्).[18] In Sanskrit, the numerals can come alone and denote meaning. For example, Siddhānta Kaumudī, on giving explanation to the Pāṉini Sūtra 1-4-51, gives examples like, देवतत्तं शतं मुष्णाति where शतं (100) is in second case and gives full meaning. Thus the meaning is very simple and straight, "When, all the three parts of Yuga were elapsed excessively, by sixes of sixty years" (यदा – When).

Thus, in the first sentence of this 3-10 śloka, the word Vyatītāḥ (plural, masculine and in first case) is the word denoting action and has the meaning of "were elapsed[17] excessively." What were elapsed excessively then? All the three parts of Yuga (Trayaśca Yugapādāḥ) - the object and is plural, masculine and is in first (nominative) case. By whom or by which, they were elapsed excessively? It was by sixes of sixty years (Ṣaṣṭyabdānām Ṣaḍbhiḥ - the agent which did the action) and is in the third (instrumental) case, as it is passive voice. Thus, the meaning is very simple and straight, "When, all the three parts of Yuga were elapsed excessively, by sixes of sixty years." Hence, there won't be any difficulty to understand that Ṣaḍbhi is the agent and is in third case as it is in passive voice and Ṣaṣyabdānām is simply the qualifying Viśeṣaṇam to highlight the Viśeṣyam of Ṣaḍbhiḥ. This can further be clarified by citing an example.

In the sentence "Sītāyāḥ Rāmeṇa rakṣitaḥ Dharmaḥ (सीतायाः रामेण रक्षितः धर्मः)," rakṣitaḥ is the past passive participle word denoting action, with Niṣṭhāḥ suffix "Ta (त)" and with the meaning "was protected." Which was protected then? It is Dharmaḥ, which is the object in first case (passive voice). Who protected Dharmaḥa? It is Rāmaḥ, who is the agent and is in third case (Rāmeṇa), as it is passive voice. Which Rāmaḥ protected Dharmaḥ? It is Sītā's (Sītāyāḥ) Rāmaḥ. Thus, Sītā is in sixth (genitive) case. Sītāyāḥ is the qualifying word - Viśeṣaṇam (विशेषणम्) and Rāmeṇa is the qualified word - Viśeṣyam (विशेष्यम्).

Thus, the following 3-10 śloka of the Kālakriyāpādaḥ (Third Adhyāyaḥ) of Āryabhaṭṭīyam with the word "Ṣaḍbhiḥ" is absolutely correct, grammatically and syntactically.

षष्ट्यब्दानां षड्भिर्यदा व्यतीतास्त्रयश्च युगपादाः ।
त्र्यधिका विंशतिरब्दास्तदेव मम जन्मनोऽतीताः ।।

Accordingly, Āryabhaṭṭa was 23 years old at Three Hundred and Sixty years (360) of Kaliyuga (3101 – 360 = 2741 B.C.E.). Thus, 2764 B.C.E. is the date of Āryabhaṭṭa and not 476 C.E.

Thus, Ṣaṣṭiḥ which is in the first (Nominative) case, as an agent (Kartṛ) in this 3-10 śloka of passive voice is syntactically wrong. If we analyse, considering both Ṣaṣṭiḥ and Yugapādāḥ as two separate objects, then also it is wrong grammatically. Pāṇini's Aṣṭādhyāyī, in the 1-4-51 sūtra अकथितं च (akathitam ca), mentioned about the use of two objects in a sentence. Siddhānta Kaumudī, the Sanskrit grammar text explained this sūtra and the 7-1-69 sūtra of Pāṇini [विभाषा चिण्णमुलोः - vibhāṣā ciṇṇamulo] (Siddhānta Kaumudī - 1.Jnanendra Sarasvati and Jayakṛishṇa - pages 129 & 445, 2. Śrīśa Candra Vasu - Numbers 539 & 2765 (Motilal Banarsidass) and Patanjali Ṛṣi's Vyākaraṇa Mahābhāṣya – text and commentary, Kaiyaṭa Upādyāya & Nāgeśa Bhaṭṭa, Chaukhamba Sanskrit Prathishthan, volume 2, pages 263 to 273 and volume 6 page 61). Accordingly, the 12 verbal roots Duh, Yāc, Pac, Daṇḍ, Rudha, Pracch, Ci, Brū, Śās, Ji, Manth, Muṣ and other 4 verbal roots Nī, Hṟ, Kṟs, Vah (total 16) alone have two separate objects in the same sentence. The secondary object is known as Gauṉa Karmaṉi (गौण कर्मणि). Of the 16, in the 12 verbal roots starting from Duh, the primary object (Karmaṉi) will be in second (Accusative) case and the secondary object (Gauṉa Karmaṉi) will be in first case, in the passive voice. In the next 4 verbal roots starting from Nī, the primary is in first case and the secondary is in the second case, in passive voice. 1. Vyatītāḥ is not of these 16 verbal roots, 2. Ṣaṣṭiḥ and Yugapādā are both in nominative (first) case and none in accusative (second) case. Hence, Ṣaṣṭiḥ is wrong either as an agent (Kartṟ) or the object in passive voice.

Here, because of the word Vyatītāḥ with Niṣṭhāḥ "Ta" suffix, the sentence is in passive voice only and is discussed elaborately. In spite of this, even if we consider it as active voice, then also Ṣaṣṭiḥ is wrong. This is because Ṣaṣṭiḥ, the agent (Kartṟ), is singular and feminine and the word Vyatītāḥ, denoting action is plural and masculine. This is not correct in active voice, where the agent and the verbal noun should agree in number, gender and case. But, first of all, the sentence itself is in passive voice and not at all in active voice.

Further, we can not take Ṣaṣṭiḥ and Yugapādāḥ in-combine as agent (Kartṟ) in active voice (first of all, it is wrong as the sentence is in passive voice) or object in the passive voice, as the word "ca (च)" was added after Trayaḥ only and not after Yugapādā or even Ṣaṣṭiḥ.

As "ca" was added after Trayaḥ, it denotes all the three parts of Yuga only and not the action of joining words. If it were to denote combination, then it would have been written after Yugapādāḥ and or Ṣaṣṭiḥ. Because, Yugapdāḥ is the object and Trayaḥ (3) denotes how many parts of Yuga i.e. giving details of Yugapādāḥ. Hence Trayaḥ is not the object, but it qualifies the object. Ca (च) is added here to qualify Trayaḥ further, stressing that **all** the three parts of Yuga were elapsed and thus definitely not to combine Yugapādāḥ and Ṣaṣṭiḥ. Besides, the words Ṣaṣṭiḥ and Yugapādāḥ are not consecutive and adjacent in this sentence of 3-10 Śloka, as the word denoting action Vyatītāḥ and yadā are in-between. Hence, Ṣaṣṭiḥ and Yugapādāḥ can not be taken in-combine as either agent or object in this sentence of 3-10 śloka. [Ca (च) can be used in the sense of combination of joining words or assertions and the joined words are normally consecutive and should be either nouns or verbs alone and not mixed]. Thus, the use of Ṣaṣṭiḥ is wrong in this sentence of 3-10 śloka of Āryabhaṭṭīyam. Thus, 3577 Kaliyuga (3600 – 23 = 3577 Kali = 476 C.E. {3577 – 3101}) is not at all the date of Āryabhaṭṭa.

Śrī Kota Venkatachelam, the great historical scholar from Vijayawada of Andhra Pradesh wrote in his Telugu book, 'Kalasaka Vinjānamu, Prathamobhāgamu - Jyotis Siddhāntula Kālanirṇayam,' in the section, Āryabhaṭṭau Kālapraśamsa, pages 56-60, gave the correct unaltered śloka [19] with all explanations. Tandulam Śrī Narayana Sastri of Chennai mentioned that he had seen in southern

Bhārat, a number of old manuscripts of Āryabhaṭṭīyam with the word Ṣaḍbhiḥ, in the first sentence of 3-10 śloka.[19] Further, from Varāhamihira's and Bhāskara's work, we can easily disprove these European's assumption of 476 C.E. as the date of Āryabhaṭṭa.

VARĀHAMIHIRA'S PAÑCA SIDDHĀNTIKĀ

Varāhamihira is the well-known astronomer of our Nation. He wrote Br̲hat Samhitā, an encyclopedia, dealing various subjects and Br̲hat Jātakam, an astrological text. He also compiled Pañca Siddhāntikā, a compilation of five out of 18 astronomical Siddhānta texts. In the Pañca Siddhāntikā in the 20th śloka of the 15th adhyāya: (Jyautiṣopaniṣad),[20] he wrote about Āryabhaṭṭa as,

लङ्कार्धराच समये दिन प्रवृत्तिं जगाद चार्यभट्टः ।
भूयः स एव सूर्योदयात्प्रभृत्याह लङ्कायां ।।

Laṅkārdharāca samaye dina pravr̲ttim jagāda
ca Āryabhaṭṭa: ।
Bhūya: Sa eva Sūryodayāt prabhr̲tyāha Laṅkāyam ।।

Meaning : Āryabhaṭṭa maintained that the beginning of the day is to be reckoned from midnight at Lanka and the same teacher again said that the day begins from the Sunrise at Lanka.

Since Varāhamihira has mentioned clearly Āryabhaṭṭa and his astronomical statistics, Āryabhaṭṭa must lived prior to

Varāhamihira's period. Further, Varāhamihira clearly mentioned his date in the same Pañca Siddhāntikā,[21] in the 8th śloka of the 1st adhyāya: as,

सप्ताश्वि वेद संख्यं शककालमपास्य चैत्र
शुक्लादौ ।
अर्द्धास्तमिते भानौ यवनपुरे सौम्यदिवसाद्ये ।।

Saptāśvi Veda sankhyam Śakakālamapāsya
Caitra Śuklādau ।
Arddhāstamite Bhānau Yavanapure
Saumyadivasādye ।।

Meaning : 1. Sapta - Seven, 2. Aśvi - Two, 3. Veda – Four, i.e. 427 years, 4. Sankhyam - Reckoning or Counting from, 5. Śakakālam - Śaka Era, 6. Apāsya - Having left - completed, 7. Caitra - Caitra month, 8. Śukla - The bright or light half of a lunar month, 9. Ādi - Beginning, 10. Ardha - Half, 11. Astama - Setting, 12. Bhānau - Sun, 13. Yavanapure - The city Yavanapuri, 14. Saumya - Budhan – the planet Mercury, 15. Divasa - Day.

The meaning is, deduct the year 427 of Śaka Era elapsed (i.e. deduct 427 from the number of years in Śaka Era for which the ahargana is wanted) at the beginning of the bright half of Caitra lunar month, when the Sun has half set at Yavanapuri at the beginning of Wednesday. This means Varāhamihira had compiled Pañca

Siddhāntikā in the year 427 of Śaka Era. Pañca Siddhāntikā of Varāhamihira, the Text edited with Sanskrit commentary and English translation by G.Thibaut and M.M.Sudhakara Dvivedi, (Chowkhamba Sanskrit Series Office, Varanasi, 1968) in the page 2 of text at the 8th śloka of the 1st Adhyāya: mentioned it as Saumya only in the left hand columns text i.e., as found in manuscript.[21] Saumya divasādye means the beginning of Wednesday (Saumya: means the Mercury, Budha, the son of Moon). But it was altered as 'Soma divasādye' which means the beginning of Monday.[21] (Soma means Moon). This is because, if we calculate the first day of the bright half of Caitra lunar month of 427 Śālivāhana Śaka elapsed, it will not fall on Wednesday. Hence, to be fit into their assumptions and wish, i.e. Śakakālam should mean only Śālivāhana Śaka, G.Thibaut and others altered Saumya into Soma. (Scanned copy of this page is at the end). This is well explained in the book, 'Chronology of Kashmir History Reconstructed' of Śrī Kota Venkatachalam, in pages 241 to 255, where Śrī V.Thirunavukarasu, M.A.,L.T., Madras Educational Services (Retd.) concluded with the golden words, "Never reject data, (which are) contrary to your theory." But these oriental experts did the very same, at all possible places.

VARĀHAMIHIRA'S BṚHAT SAMHITĀ

Now one has to found out, the starting year of this Śaka Era, to know the correct date of Varāhamihira. This was clearly mentioned by Varāhamihira, in his Br̲hat Samhitā in the in 3rd śloka of 13th adhyāya:[22] as,

आसन्मघासु मुनयः शासति पृथ्वीं
युधिष्ठिरे नृपतौ ।
षट् द्विक पञ्च द्वियुतः शककालस्तस्य राज्ञश्च ।।

Āsan Maghāsu Munaya: Śāsati Pr̲thvīm
Yudhiṣṭhire nr̲patau ।
Ṣaṭ dvika pañca dviyuta: Śakakālastasya
Rajñaśca ।।

The Meaning: 1. Āsan - Inhabite – present in, 2. Maghā - The constellation of Magha group of stars, 3. Munaya: - Saptar̲ṣi Manḍalam – group of Stars – Great Bear Constellation, 4. Śāsati Ruled (or) governed, 5. Yudhiṣṭhira - Yudhiṣṭhira Dharma Raja of Pañca Pānḍava, 6. Nr̲pa - King, 7. Ṣat - Six, 8. Dvika - Two, 9. Pañca - Five, 10. Dvi - Two, i.e. 2526 years, 11. Śakakāla - Śaka Era, 12. Tasya Rājñaśca - Of that monarch (Yudhiṣṭhira).

"The Seven sages (The Great Bear) were stationed in the asterism Magha, when the King Yudhishṭhira was ruling. The commencement of the Śaka Era took place 2526 years after the period of that Monarch is the meaning. All know, Yudhiṣṭhira of Pañca Pānḍava won the Mahābhārata war in 3138 B.C.E. and ruled for 36 years up to 3102 B.C.E. In 3101 B.C.E., the Kaliyuga started and

25 years after i.e. in 3076 B.C.E., King Yudhiṣṭhira left the world and until 3076 B.C.E., the Saptaṟṣi Maṇḍalam was in Magha constellation as per the astronomical data. Therefore, 2526 years after this, the Śaka Era started is the statement of Varāhamihira. Thus, Śaka Era (the Era of the King Cyrus II of the Śaka Kingdom) started in 550 B.C.E. (3076 – 2526). Therefore, the year of compilation of Pañca Siddhntikā by Varāhamihira was 123 B.C.E. (550 – 427). Hence, Varāhamihira lived in the first century B.C.E. Hence, Āryabhaṭṭa's date cannot be fixed at a latter period of 476 C.E.

This śloka of Bṟhat Samhitā, mentioning the beginning year of Śaka Era, was mentioned in the same form, except the word Rājñaśca is mentioned as Rājyasya, in Kalhaṉa's Rājataraṅginī (1st Taraṅga: 56th śloka). [23] It is a historical text detailing the chronology of Kashmir Kings from Mahābhārata war till the period of Kalhaṉa (520 / 1148 C.E.). He was the son of the King of Shanbagapuri in Kashmir, who was also the Chief Minister of Kashmir.

ŚAKA ERA (ŚAKANṞPA ERA)

Śaka Era (Śaka Kāla) began at 550 B.C.E. King Cyrus II of Pāraśīkam started this Śakanṟpa Era (Śaka Era - Śaka Kāla - Śaka Bhūpa (King) Kāla - Śakendra (Ruler) Kāla - Cyrus Era) in 550 B.C.E. He was the King (Nṟpa) of Śaka people. So Śaka Nṟpa Era is definitely his era only. He defeated his enemies and became the

King of Pāraśīkam in 550 B.C.E. He belongs to Paraśaka, a division of Śaka people. These Śaka people are the outcasted Kshatriyas of Bhāratian origin. From Bhārat, they migrated to Paraśakam and settled there. Their place was known after their name Paraśaka, as Paraśakam,[24] later known as Pāraśīkam (Iran).

Though, King Vikramāditya (57 B.C.E.) and his great grand son King Śālivāhana (78 C.E.) of Ujjayanī, won these Śaka and become Cakravarties of Bhārat, they were not born in Śaka family. So, they can not be Śaka and Śaka Nṟpa (Śaka King, Nṟpa - King). They can only be Śakāri i.e. enemy or conquerors or ruler (so, rarely as Śakendra) of Śaka and are not at all Śakanṟupa (Śaka King). We are not mentioning Ashoka as Kalinga but only as Mauriya, though he won Kalinga. Hence, Śakanṟpa Era - Śaka Era - Śaka Kāla or a mere Śaka does not mean either Vikramāditya Era of 57 B.C.E. or the Śālivāhana Era of 78 C.E. but it means only Cyrus Era of 550 B.C.E. Śālivāhana Era was mentioned as Śaka varṣa (number of years in that era) only. However, in the case of later astronomical texts, Śaka also means Śālivāhana Era, as it is the latest of all the Eras and due to the diminishing usage of previous eras. This is because, the Sanskrit word 'Śaka' has two distinct meanings. The first one is 'power and strength.' The root is 'Śak.' From this only the Śaka people,[24] the outcasted Kshatriyas of Bhāratian origin who are powerful and strong, got their name. In the legends, it was mentioned that they were produced by the holy cow of Vaśiṣṭa, Kāmadhenu:

from her sweat to destroy the army of Viśvāmitra (Kauśika Rājā).[25] So Śaka Era means the era of these Śaka people only.

The second meaning is 'era or epoch - Kāla' where the root [26] is Vedic with the meaning 'to know' – to know from which event, the years are counted. In that meaning only, it is named as Vikrama Śaka and Śālivāhana Śaka, where Śaka means Era (Kāla –Time). So, if we assume that Śaka Kāla (Śaka Era) is denoting Vikrama Śaka and Śālivāhana Śaka, then the meaning will be Era Era or Kāla Kāla or Śaka Śaka, which doesn't make any meaning. This is because, in "Vikrama Śaka and Śālivāhana Śaka" the word Śaka already has the meaning of era (Kāla). Hence, what is the necessity of repeating again the word "Kāla," in "Śaka Kāla?"[26] Thus, in the word 'Śaka Kāla,' Śaka means strength, thereby denotes Śaka King Cyrus only and not 'Era' as it was denoted by 'Kāla' in the word Śaka Kāla. (Śaka - Śaka King, Kāla – Era). Hence, Śaka Kāla mentioned in the foreseen 3rd śloka of 13th Adhyāya of Bṟhat Samhit meant only Cyrus era of 550 B.C.E. and thus,Varāhamihira's period is 123 B.C.E.

Further, this Śakanṟupa Era (Cyrus Era of 550 B.C.E.) came to end in 3179 Kali. This was clearly mentioned by Bhāskarācārya himself, in the 28th śloka of Kālamānādhyāya: of Madhyamādhikāra: Grahaganitādhāya: of Siddhānta Śiromani:[27] The śloka is,

नन्दाद्रीन्दु गुणास्तथा शकनृपस्यान्ते कलेर्वत्सराः ।

Nanda Adri Indu Guṇāstatha Śakanṛpasyānte
Kalervatsarā: ।

Meaning : 1. Nanda - Nava Nanda – so Nine, 2. Adri - Seven Hills – so Seven, 3. Indu - Moon – so One, 4. Guṇa – Triguṇa - so Three i.e. 3179 years, 5. Śakanṛpasya – (Era) of Śaka King (Nṛpa – King) 6. Ante – Ends, 7. Kaler – Kaliyugābdam, 8. Vatsarā: - Years.

Thus, Bhāskarācārya himself clearly mentioned in this śloka that the Era of Śakanṛpa ended (Śakanṛpasya Ante) in Kaliyugābdam 3179 year, i.e.78 C.E. (3179 – 3101). Since Śālivāhana Śaka began only in Kaliyugābdam 3179 year, i.e. 78 C.E. (3179 – 3101), at which the Śakanṛpa Era came to an end, the Śakanṛpa Era mentioned by Bhāskarācārya is definitely not Śālivāhana Śaka but the Era of Cyrus II, the King of Śaka people. Thus, the Śaka Kāla mentioned by Varāhamihira is the Cyrus Era of 550 B.C.E. and Varāhamihira's period is 123 B.C.E. Since, Varāhamihira quoted Āryabhaṭṭa in his Pañca Siddhāntikā, the date of Āryabhaṭṭa is definitely not 476 C.E.

Moreover, the great poet Kālidāsa also mentioned the date of Varāhamihira.

KĀLIDĀSA'S JYOTIRVIDĀBHARAṈAM

Kālidāsa wrote Jyotirvidābharaṉam, an astrological text. In this text, in the 21st śloka of the 22nd adhyāya:, Kālidāsa mentioned as,[28]

वर्षैः सिन्धुर दर्शनाम्बर गुणैर्याते कलौ सम्मिते
मासे माधव संज्ञिके च विहितो ग्रन्थ क्रियोप क्रमः ।

Varṣai: Sindhura Darśanāmbara Guṉairyāte
Kalau Sammite
Māse Mādhava Samjñike Ca Vihito Grantha
Kriyopa Krama: ।

Meaning : 1. Varṣai: - Year, 2. Sindhura - Elephant – so the number Eight, 3. Darśana - Ṣat darśana – so the number Six, 4. Ambara - Sky – so the number Zero, 5. Guṉa - Tri Guṉa – so the number Three i.e. 3068 years, 6. Yāte - was gone, 7. Kalau - Kaliyuga, 8. Sammite - Measured out, 9. Māse - Month, 10. Mādhava - Vaiśākha Month.

This means that the poet Kālidāsa started writing this text, Jyotirvidābharaṉam, in the month of Vaiśākha: (and ended in the Month Kārtika:) in the year 3068 of Kaliyugābdam. Kali 3068 is 33 B.C.E. (3101–3068). Therefore, the great poet Kālidāsa lived in First century B.C.E. is the definite conclusion arrived from this śloka.

In the same text Jyotirvidābharaṉam, in the 10th śloka of 22nd adhyāya:, Kālidāsa mentioned[29] as,

धन्वन्तरिः क्षपणकामरसिंह शङ्कु वेतालभट्ट
घटखर्पर कालिदासाः ।
ख्यातो वराहमिहिरो नृपतेः सभायां रत्नानि वै
वररुचिर्नव विक्रमस्य ।।

Dhanvantari: Kṣapaṉakāmarasimha Śaṅkur
Vetālabhaṭṭa Ghaṭakharpara Kālidāsā: ।
Khyāto Varāhamihiro nṟpate: sabhāyām ratnāni
vai Vararucirnava Vikramasya ।।

This means that the nine gems in the court of the King (Nṟpa) Vikramāditya were Dhanvantari, Kṣapanaka, Amarasimha, Śaṅku, Vetālabhaṭṭa, Ghaṭakharpara, Kālidāsa, the famous Varāhamihira and Vararuci. According to the 21st śloka mentioned before, Kālidāsa lived in First century B.C.E. Therefore, we can conclude that Varāhamihira who along with Kālidāsa was also there, in the court of Vikramāditya and all the three lived in the First century B.C.E. Further, according to the Almanac's of our Nation, Traditions and Government's calculations, the Vikrama Era of this King Vikramāditya started in 57 B.C.E. and the present year 2011 C.E. is 2068 – 2069 year (2011 + 57) of the Vikrama Era. From this also, we can conclude that the King Vikramāditya of Ujjainī, the great poet Kālidāsa and the famous Varāhamihira, all lived in first century B.C.E. only. So the date of Varāhamihira, as stated by these European orientalists, at 505 C.E. is totally wrong and misleading. But, they maintain that 1. Āryabhaṭṭa wrote Āryabhaṭṭīyam in 499 C.E. and 2. Varāhamihira compiled Pañca Siddhāntikā in 505 C.E., mentioning Āryabhaṭṭa as an authority and his two methods of day reckoning in this text, in 20th śloka of 15th addhyāya:.[20] Is it possible for the fame and the methods of Āryabhaṭṭa to spread to various parts of the Nation, so as to reach Varāhamihira, within a short span of six years, 1500 years before, when transport and communications were slow. Further, Varāhamihira mentioned[30] in his Pañca Siddhāntikā (3rd śloka 1st addhyāya:) that Lāṭadeva wrote commentaries on Romaka (Lomaka) Siddhānta: and Pauliśa Siddhānta:. Lāṭadeva was a direct pupil of Āryabhaṭṭa, as found in Bhāskara's commentary 3-10 śloka of Āryabhaṭṭīyam.[31] As per this view, date of Lāṭadeva would have been much latter to 499 C.E., i.e., at least a few years latter than 505 C.E. Then, if the date of Varāhamihira is 505 C.E., how could Varāhamihira mention Lāṭadeva and his commentaries? Hence, 505 C.E. is not at all the date of Varāhamihira. Some may argue that 505 C.E. as the date of Romaka Siddhānta: and so, the date of Varāhamihira is latter than 505 C.E. This will not hold good, as Bhāskara mentioned in his commentary on Āryabhaṭṭīyam (2-1 śloka) that Āryabhaṭṭa learned knowledge at Kusumapura, where Romaka

Siddhānta: was already taught and famous.[32] Hence, the date of Romaka Siddhānta: can not be after the date of Āryabhaṭṭa and is not 505 C.E. So the fact is, Varāhamihira compiled Pañca Siddhāntikā in 123 B.C.E. and hence date of Āryabhaṭṭa is definitely before first century B.C.E. Statement of Bhāskara further proves it clearly.

LAGHU BHĀSKARĪYAM OF BHĀSKARA

Bhāskara, the astronomer of Āryabhaṭṭa tradition, wrote Commentary on Āryabhaṭṭīyam and Laghu and Mahā Bhāskarīyam. Bhāskara's period is estimated as 522 C.E. or at the most 629 C.E., which is the year in which he wrote his commentary on Āryabhaṭṭīyam. He mentioned in the second śloka of Laghu Bhāskarīyam as,[33]

काले महति देशे वा स्फुटार्थं यस्य दर्शनम् ।
जयत्यार्यभट्टः सोऽब्धि प्रान्त प्रोल्लङ्घि सद्यशाः ।।

Kāle mahati dese vā sphuṭārtham yasya darśanam ।
Jayatyāryabhaṭṭa: soऽbdhi prānta prollanghi
sadyaśā: ।।

Meaning : Victorious is Āryabhaṭṭa, whose excellent fame had crossed the bounds of the oceans and whose science (Astronomical treatise) leads to accurate results, in a lot of countries, even after the lapse of so much time.

We have to give much importance to the word, "after the lapse of so much time, (Kāle Mahati)". Even after the lapse of so much long time, Āryabhaṭṭa's statistical data on astronomy were found to be correct in a lot of countries is the meaning of this śloka. Further, Bhāskara mentioned that the fame of victorious Āryabhaṭṭa had crossed the boundaries of the oceans. Therefore, the time difference between Aryabhaṭṭa and Bhāskara should be so much (Kāle Mahati), which was required for the fame of Āryabhaṭṭa to cross the Oceans to reach a lot of countries, at that ancient period.

Further, Bhāskara told that Āryabhaṭṭa's astronomical data, though calculated so much time before, leads to accurate results, even after the lapse of so much time, i.e. at the period of Bhaskara itself. This statement should be given its due importance. Therefore, the difference of period between Āryabhaṭṭa and Bhāskara is not definitely just 23 years (522 – 499) or 130 years at the maximum (629 – 499) as stated by these European orientalists, who maintain that 499 C.E. as the date of Āryabhaṭṭīyam and 629 C.E. as the year of commentary written by Bhāskara on Āryabhaṭṭīyam. But, it must be more than thousands of years, as Bhāskara used the superlative degree in this śloka i.e. so much time – Kāle Mahati.

Further, Bhāskara himself told that he was not a direct disciple of Āryabhaṭṭa. He frequently mentioned, "that is what we heard about Āryabhaṭṭa." So the difference of period between Āryabhaṭṭa and Bhāskara will not be just 130 years. As per these European's statement, in 499 C.E., Āryabhaṭṭa was 23 years old. If it were so, then he would have lived up to 550 C.E. Bhāskara wrote the commentary on Āryabhaṭṭīyam in 629 or 522 C.E. Even if he was just 29 years at that period, he would have born, at the latest, in 600 C.E. So just a fifty years of difference between Āryabhaṭṭa and Bhāskara can not be stated as Kāle Mahati (so much time), by Bhāskara. If we took the date of Bhāskara as 522 C.E., as per some scholar's opinion, then Bhāskara would become junior contemporary of Āryabhaṭṭa. Then where is the need for the statement, "after so much time" (Kāle Mahati). Thus, this śloka totally refutes these European's date of Āryabhaṭṭa, as 476 C.E.

Thus, with all these facts, we can strongly conclude that **the date of Āryabhaṭṭa is 2764 B.C.E.,** and is definitely not 476 C.E.

DATE OF MAHĀRYABHAṬṬA SIDDHĀNTA:

Adding fuel to the fire, Mahāryabhaṭṭa Siddhānta:, the other astronomical and mathematical text of Āryabhaṭṭa, received the same treatment as that of Āryabhaṭṭīyam, at the hands of these so called oriental experts. Its antiquity was also reduced, on flimsy, very weak and unconvincing reasons, in spite of the fact that Āryabhaṭṭa himself mentioned it clearly that he had written this text when the Kaliyuga had just progressed only a very little from its beginning. The 2nd śloka of the 2nd adhyāya: (Pārāśaryamatāntarādhikāra:) of text mentioned it as [34]

एतत्सिद्धान्तद्वयं ईषद्याते कलौयुगे जातम् ।
स्वस्थाने दृक्तुल्या अनेन खेटाः स्फुटाः कार्याः ।।

Etat Siddhāntadvayam ēṣadyāte Kalauyuge jātam ।
Svasthāne dr̲ktulyā anena kheṭā: sphuṭā: kāryā: ।।

Meaning :- Etat – This (singular), Siddhāntadvayam - The Siddhānta in dvayam – in pair form (Mahāryabhaṭṭa Siddhānta: contains one Pūrvārdha Rūpa: known as Grahaganitādhyāya: and the second one Uttarārdha Rūpa: known as Golādhyāya:) ēṣad - a very little, slight, yāte - was gone, Kalauyuge - in Kaliyugam, jātam - beginning, origin.

Thus, Āryabhaṭṭa mentioned it clearly that he wrote this Mahāryabhaṭṭa Siddhānta: which is in pair form namely Pūrvārdha Rūpa: – Grahaganitādhyāya: and the Uttarārdha Rūpa: – Golādhyāya: at the very early years of Kaliyuga.

Further, in the 1st and 2nd śloka of this Adhyāya: [35] Āryabhaṭṭa clearly distinguished his Siddhānta: (established text, treatise) from Parśara's Matam (view, concept, doctrine). He mentioned the text of Parāśara as Matam (Pārāśaryam Matam) and his text as Siddhānta: distinctively. So Siddhāntadvayam mentioned in this 2nd śloka denotes only Mahryabhaṭṭa Siddhānta: which is in pair form. If it denotes both these texts (Pārāśaryam Matam and Mahryabhaṭṭa Siddhānta:), then it would have been written as Ete (एते – dual - both) instead of Etat (एतत् – singular - this) in the first line of this śloka.

Besides in the Madhyamādhyāya: (1st adhyāya:), Āryabhaṭṭa explained the calculation of Ahargana (number of days elapsed from a chosen epoch)[36] in the śloka 25, 35, 36, 48, and 51. He mentioned the calculation of ahargana from the beginning of the present Kalpa up to the beginning of the present Kaliyuga only. For ahargana of dyugana, he used the words, Kalijayuta: (25th śloka) Kalijakshepa (35th and 51st śloka) Kalimukha (36th śloka) and Kalivaktra (48th śloka), meaning the beginning of Kaliyuga. Here Āryabhaṭṭa chose the beginning of the present Svetavārāha kalpa as his epoch and calculated the number of years elapsed up to the beginning of the present 28th Kaliyuga of the present Vaivasvata (7th) Manvantara. This confirms that Āryabhaṭṭa lived at the very early years of the Kaliyuga. If he had lived a few thousands of years after the beginning of Kaliyuga, he would have mentioned the number of years elapsed in Kaliyuga also and would have not stopped counting the years up to the beginning of the Kaliyuga. Further, he would have used some other epoch like Śaka era (King Cyrus era – 550 B.C.E.), Srī Harṣa era (457 B.C.E.), Vikramāditya era (57 B.C.E.) or Śālivāhana era (78 C.E.) as done by latter astronomers of our Nation. However, Āryabhaṭṭa stopped calculating the number of years elapsed abruptly up to the beginning of Kaliyuga itself, as found in 19th śloka of Madhyamādhyāya: (1st adhyāya:) of Mahāryabhaṭṭa Siddhānta: The śloka is,[37]

चा मनवश्छा याताः सन्धय इह रथमितानि च युगानि।
गा युगचरणा ऐक्यं कुधिथिरधोभीघुनोनोनाः ।।

Cā Manạvaśchā yātā: sandhaya iha rathamitāni ca yugāni ।
Gā yugacaraṉā aikyam kudhithiradhobhīghunononā: ।।

Here Āryabhaṭṭa mentioned the number of years that were passed since the beginning of the Kalpa, up to the beginning of the Kaliyuga i.e. the total years of six manvantara, seven manvantra sandhi, twenty seven mahāyuga and three parts of yuga namely Kr̲ta (Satya), Tretā and Dvāpara which are equal to 197,29,44,000 years. In Katapayādi saṅkhyā, khu – 1, dhi – 9, thi – 7, ra – 2, dho – 9, bhī – 4, ghu – 4, no – 0, no – 0, nā – 0. Thus, kudhithiradhobhīghunononā: is 197,29,44,000. So, the number of years for,

6 manvantara (1 manvantara = 71 mahāyuga; 1 mahāyuga = 43,20,000 years)		
Thus, 6 x 71 x 43,20,000	=	184,03,20,000
7 manvantara sandhi (7 x 17,28,000) (1 manvantara sandhi is equal to 1 Kr̲tayuga)	=	1,20,96,000
27 mahāyuga (27 x 43,20,000)	=	11,66,40,000
1 Kr̲tayuga	=	17,28,000
1 Tretāyuga	=	12,96,000
1 Dvāparayuga	=	8,64,000
Total years from the begining of Svetavārāha Kalpa up to the beginning present Kaliyuga	=	197,29,44,000

This proves that Āryabhaṭṭa mentioned the number of years that were passed up to the beginning of the Kaliyuga only. Besides, he also mentioned the number of days that were passed from the beginning of the Kalpa up to the beginning of this Kaliyuga only, in the 17th śloka of the Pārāśaryamatāntarādhikāra:[38] in katapaydi saṅkhyā as सरनचगघधमभरकेधा कल्यादौ द्युगण एषः । i.e. up to the beginning of Kaliyuga (कल्यादौ), the total number of days (द्युगण) are Saranacagaghadhamabharakedhā (sa – 7, ra – 2, na – 0, ca – 6, ga – 3, gha – 4, dha – 9, ma –5, bha – 4, ra – 2, ke – 1, dhā – 9 = 72,063,49,54,219. Thus, the number of days per year as per Mahāryabhaṭṭa Siddhānta: are 365.25869 (72,063,49,54,219 ÷ 197,29,44,000).

This is in confirmation with the value got from the astronomical constants given in the 7th and 13th śloka[39] of the Madhyamādhyāya: (1st adhyāya:) of Mahāryabhaṭṭa Siddhānta: In the 7th śloka, the total number of (apparent) revolutions of the Sun (the Earth) in one Kalpa, are mentioned as 432,00,00,000. This is the number of years in one Kalpa, because the Earth revolves round the Sun at the rate of one revolution per one year. In the 13th śloka, the total numbers of days in one Kalpa are given as 1,57,791,75,42,000. Then, the number of days in one year will be 365.25869 (1,57,791,75,42,000 ÷ 432,00,00,000). Thus, all these evidences strongly conclude that Āryabhaṭṭa wrote Mahāryabhaṭṭa Siddhānta: at the very early years of Kaliyuga.

THE MISDEED REPEATED

But, these European orientalists and their followers could not accept this date for Mahāryabhaṭṭa Siddhānta: because of the reasons already discussed under the date of Āryabhaṭṭīyam. Further, the 14th sloka of Pātādhikāra: (13th adhyāya:) of this text mentioned about a senior Āryabhaṭṭa, even much ancient to Mahāryabhaṭṭa Siddhānta:. It mentioned the word 'Mahākālāt' which means 'at a very ancient time.' The śloka is, [40]

वृद्धार्यभट्ट प्रोक्तात् सिद्धान्ताद्यन्महाकालात् ।
पाठैर्गतमुच्छेदं विशेषितं तन्मया स्वोक्त्या ।।

Vr̲ddha Āryabhaṭṭa proktāt Siddhāntādyan
mahākālāt ।
Pāṭhairgatamucchedam viśeṣitam tat mayā
svoktyā ।।

Meaning :- Vr̲ddha - old, senior, mahākālāt - at a very ancient time.

Thus, Mahāryabhaṭṭa Siddhānta: clearly mentioned a senior Āryabhaṭṭa, of a much more ancient period than the very early years of Kaliyuga. This means his period was thousands of years before Kaliyuga and Kaliyuga started at 3101 B.C.E. Thus, even if fixed very much later, the date of this senior Āryabhaṭṭa will be at least

4100 B.C.E., because one has to allot, at the lowest, a minimum of thousand years for 'mahākālāt.' Then it will totally shatter the fundamental belief of these Europeans, in which the Earth was said to be created in 4004 B.C.E. Therefore, they tried to push forward the date of Mahāryabhaṭṭa Siddhānta: as late as possible, so that they can also push forward the date of senior Āryabhaṭṭa, mentioned in above śloka. With this, they maintained that the author of Mahāryabhaṭṭa Siddhānta: was a different person than that of Āryabhaṭṭīyam and thus named him as Āryabhaṭṭa II. His period was wrongly fixed at about 950 C.E., without giving any concrete proof. Some of them view that the senior Āryabhaṭṭa mentioned in the above śloka may be the author of Āryabhaṭṭīyam, who was named as Āryabhaṭṭa I and his date was, in the same way, wrongly fixed at 476 C.E. Thus, to fulfill their hidden ambition, these westerners and their followers declared on their own that there were two Āryabhaṭṭau, i.e. Āryabhaṭṭa I as the author of Āryabhaṭṭīyam and Āryabhaṭṭa II as author of Mahāryabhaṭṭa Siddhānta:. Nevertheless, the author of Āryabhaṭṭīyam and Mahāryabhaṭṭa Siddhānta: was one and the same and his date was 2764 B.C.E. (very early years of Kaliyuga). This can be further proved by the following facts.

1. The contemporary dates of the two texts

As shown above, the date of Āryabhaṭṭīyam is 360 Kali (very early years of Kaliyuga) and that of Mahāryabhaṭṭa Siddhānta: is also at the very early years of Kaliyuga.

2.Bhāskara's writing

Bhāskara in his commentary on Āryabhaṭṭīyam (Dasagītikā-Sūtra-Vyākya and Āryabhaṭṭa-Tantra-Bhāṣya) under the heading Jyotiṣaśāstraprādurbhāve Vyākhyākāramatam,[41] on explaining 1st and 2nd śloka of the Gītikapāda: (1st adhyāya:), mentioned clearly as,

अथ कथमस्यातीन्द्रियाणां स्फुटग्रहगत्यर्थानां प्रादुर्भावः?
ब्रह्मणः प्रसादेनेति ।
एवमनुश्रूयते - अनेनाचार्येण महद्भिस्तपोभिर्ब्रह्माऽऽराधितः ।
अतोऽस्य तत्प्रसादेन स्फुटग्रहगत्यर्थानां प्रादुर्भाव इति ।
आह च -
अतीन्द्रियार्थावगतेस्तपोभिः परोपकार क्षम काव्य दृष्टेः ।
योऽलङ्कृतेरव्ययमन्वयस्य पराशरस्यानुकृतिं चकार ।।

Atha kathamasyātīndriyāṉām sphuṭagrahagatyarthānām
prādurbhāva:? **Brahmaṉa:** prasādeneti ।
Evam anuśrūyate - anenācāryeṉa mahadbhistapobhir
Brahmāऽऽrādhita: ।
Atoऽsya tatprasādena sphuṭagrahagatyarthānām
prādurbhāva iti । Āha ca -
Atīndriyārthāvagatestapobhi: paropakāra kṣama
kāvya dṟuṣṭe: ।
Yoऽlańkṟteravyayamanvayasya **Parāśarasyānukṟtim** cakāra ।।

Here Bhāskara mentioned, "This is what one hears said: This

Ācārya Āryabhaṭṭa worshipped Brahma, by severe penance. Thereby, the true knowledge of the subjects pertaining to the true motion of the Graha was revealed to him, by the grace of Brahma. It is said, "Āryabhaṭṭa, who followed into the footsteps of Parāśara, the ornament among the men and who came in the lineage of Brahma, acquired the knowledge of the subjects beyond the reach of senses." Thus, it is very clear that Āryabhaṭṭa was a worshipper of Brahma and the follower of Parāśara. This was as exactly revealed by Āryabhaṭṭa himself in his two texts, Āryabhaṭṭīyam and Mahāryabhaṭṭa Siddhānta:. In Āryabhaṭṭīyam, in 1st śloka of Gītikapāda: and that of Gaṉitapāda: (1st and 2nd adhyāya:)[42] Āryabhaṭṭa mentioned that he set forth his text only after having paid obeisance to Brahma. Further, in the 13th śloka of the Gītikapāda: he mentioned that one can attain the Supreme Brahma, by knowing the Daśagītika- sūtram.[43]

In Mahāryabhaṭṭa Siddhānta: in the 1st śloka of the Pārāśaryamatāntarādhikāra: (2nd adhyāya:),[35] Āryabhaṭṭa mentioned that he wrote his Siddhānta: based on Parāśara's matam (Pārāśaryam matam) and Pārāśaryam matam was best, famous and praised much in Kaliyuga and his Siddhānta: was similar to Pārāśaryam matam, on mean motions of Graha. The śloka is,

कलिसंज्ञे युगपादे पाराशर्यं मतं प्रशस्तमतः ।
वक्ष्ये तदहं तन्मम मततुल्यं मध्यमान्यत्र ।।

Kalisamjñe yugapāde Pārāśaryam matam
praśastamata: ।
Vakṣye tadaham tanmama matatulyam
madhyamānyatra ।।

Thus, it is very much obvious that Āryabhaṭṭa started writing Āryabhaṭṭīyam by paying obeisance and bowing with reverence to Brahma and wrote Mahāryabhaṭṭa Siddhānta: based on Parāśara's text. This was exactly proclaimed by Bhāskara in his commentary on Āryabhaṭṭīyam, as seen above. There Bhāskara mentioned in a very clear way that Āryabhaṭṭa got the true knowledge of the subjects pertaining to the true motion of the Graha by worshiping Brahma and followed into the footsteps of Parāśara, who came in the lineage of Brahma. This proves that the author of Āryabhaṭṭīyam and that of Mahāryabhaṭṭa Siddhānta: was one and the same Āryabhaṭṭa and not of two different persons.

3. Varāhamihira's Pañca Siddhāntikā

As shown before, in the 20th śloka of the 15th adhyāya:[20] (jyotiṣopaniṣad) of Pañca Siddhāntikā, Varāhamihira mentioned that Āryabhaṭṭa maintained that the beginning of the day is to be reckoned from midnight at Lanka and he again said that the day begins from the Sunrise at Lanka. The Āryabhaṭṭa's method of reckoning of days from midnight at Lanka is mentioned by Bhāskara, in his Mahābhāskarīyam (Mahāryabhaṭṭa Karma Nibandha:),[44] in the śloka 21st to 35th of the

7th chapter which deals with astronomical constants. These astronomical constants of this midnight day-reckoning are exactly similar to that of Sūrya Siddhānta:, as given in Varāhamihira's Pañca Siddhāntikā in the 16th adhyāya: (Sūrya Siddhānte Madhyagati:),[45] dealing with the mean motions of Graha. Here, Sūrya Siddhānta: adopted the midnight day-reckoning, as mentioned in the 1st sloka of this 16th adhyāya:. Thus, because of these common features between these two texts, the view that the text of Āryabhaṭṭa with the midnight day-reckoning was based on Sūrya Siddhānta: was enhanced further.

However, this text of Āryabhaṭṭa with the midnight day-reckoning is not yet traceable and it is mentioned as (Laghu) Āryabhaṭṭa Siddhānta: or Laghu Āryabhaṭṭīyam. G Thibaut mentioned as,[46] "Now, Āryabhaṭa's rules are known to us from the Laghu Āryabhaṭīya, and they agree in all essential points with the corresponding rules of Sūrya Siddhānta," in his introduction to the book, Pañca Siddhāntikā of Varāhamihira, in the page xxvii. Thus, this text was available during 1890s. But why, where and how it vanished is the unanswered mystery now.

The Āryabhaṭṭa's method of reckoning of days at Sunrise at Lanka is mentioned in the Mahāryabhaṭṭa Siddhānta:[47] in the 47th śloka of the Madhyamādhyāya: (1st adhyāya:). The śloka states that the revolutions of the Graha are to be calculated from the Sunrise at Lanka, which means that the days are to be reckoned from Sunrise at

Lanka. Āryabhaṭṭīyam also mentions it [48] in the same way in the 4th śloka of Gītikapāda:. Thus, Āryabhaṭṭa used the midnight day-reckoning from Lanka in (Laghu) Āryabhaṭṭa Siddhānta: and this text may be based on Sūrya Siddhānta:. He also used Sunrise day-reckoning from Lanka in Mahāryabhaṭṭa Siddhānta: and Āryabhaṭṭīyam and these two texts mentioned it in a very similar way.

But, to mask the similarity in the names of (Laghu) Āryabhaṭṭa Siddhānta: and Mahāryabhaṭṭa Siddhānta:, the so called oriental experts altered the name of Mahāryabhaṭṭa Siddhānta: into Mahā Siddhānta: omitting the name of the author itself, even though the name of the text was mentioned as Mahāryabhaṭṭa Siddhānta: at the end of first four adhyāyā:, by the author Āryabhaṭṭa himself. For example, at the end of first and second adhyāyā:, Āryabhaṭṭa mentioned it as,

इति महार्यभट्ट सिध्दान्ते मध्यगतिर्नाम प्रथमोऽध्यायः ।

Iti Mahāryabhaṭṭa Siddhānte madhyagatirnāma
Prathamoऽdhyāya: । [49]

इति श्रीमहार्यभट्ट सिध्दान्ते पराशर्यमतान्तराधिकारो
द्वितीयः ।

Iti Srīmahāryabhaṭṭa Siddhānte Parāśaryamatāntarādhikāro
Dvitīya: । [49]

Inspite of this, they preferred the name Mahā Siddhānta:, there by masking the similarity in the names between these two texts. This is to prevent us from the correct understanding of our ancient history. Accordingly, they mentioned Mahāryabhaṭṭa Siddhnta: as Mahā Siddhānta: and Laghu Āryabhaṭṭa Siddhānta: (Laghu Āryabhaṭṭīyam) as Ārya Siddhānta: or Āryabhaṭṭa Siddhānta:

THE HALLOW ARGUEMENT

In spite of the foreseen strong evidences favouring the date of Mahāryabhaṭṭa Siddhānta: at the very early years of Kaliyuga, these oriental experts unilaterally fixed it at about c 950 C.E., on flimsy grounds. Their arguments were based on the mathematical formulas found in Mahāryabhaṭṭa Siddhānta: and the other ancient mathematical texts of our Nation. According to them, the formula for calculating the area of a quadrilateral and the π (pai) values given in these Bhāratian ancient texts are much useful in fixing their chronology.

1. Mahāvīrācārya, the ancient mathematician of our Nation wrote a mathematical text, known as Gaṇitasārasaṅgraha:. His period was estimated as c 850 C.E., since he had wished prosperity to the Rāṣṭrakūṭa King Amoghavarṣa Nṛpatunga,[50] whose period of reign was C.E. 814 – 878. In the 50th Śloka of 7th adhyāya: of this text,[50] he mentioned the formula for calculating the area of a quadrilateral as $\sqrt{[(s-a)(s-b)(s-c)(s-d)]}$, where a,b,c,d are the sides of the quadrilateral and $s = (a + b + c + d) \div 2$. However, Śrīdharācārya in his Pāṭīgaṇitam[51] mentioned two formulas. In 117th sloka, he mentioned

the above formula for quadrilaterals having either equal or unequal sides, but always with unequal altitudes. In 115th śloka he mentioned another formula for quadrilaterals of equal altitudes as ½ (base + face) X altitude. The 78th śloka in the Pāṭyadhyāya: (15th adhyāya:) of Mahāryabhaṭṭa Siddhānta:[52] mentioned this second formula but it stressed the importance of the diagonal in this 78th and the 70th śloka of same adhyāya:. Based on this, these orientalists mention that Mahāvīrācārya who gave a rudimentary formula, must be earlier than the two. Then came Śrīdharācārya, who gave a better formula and the Mahāryabhaṭṭa Siddhānta: as the lattest of all the three, because it stressed the importance of the diagonals of quadrilaterals. (But, Mahāvīrācārya gave the second formula also, in the same 7-50 śloka [not for inequi-lateral quadrilaterals].[50] But, these experts missed it and framed their own theories to reduce our Nation's antiquity. This is their level of research.)

Since the period of Mahāvīrācārya was fixed at c 850 C.E., they told that the period of Śrīdharācārya might be between C.E. 850 to 950. On what basis they have allotted 100 years for this, nobody explained. Is it only 100 years required to develop a formula? Why not more or even less? No answers. Then, they told that the period of Mahāryabhaṭṭa Siddhānta: must be latter to Śrīdharācārya, since it stressed the importance of the diagonals [53] and thus, it may be fixed at about c 950 C.E. So, all are assumptions and guess work only, since no author had quoted other's name or even the name of other's text. Further, developing and using mathematical formulas depends on individual perception and knowledge. Therefore, a person of earlier period may develop a correct formula, which may not be available to the persons of latter period, due to various reasons prevalent at that time or even available, the junior can have a different view. Further, we can not say that the progress of science and technology always goes parallel with time and the vice versa can also happen in the history of science and technology. The same thing holds good for their examples also.

2. Śrīdharācārya [53] mentioned the value of π (pai) as √10 (3.1622776). Mahāryabhaṭṭa Siddhānta:[54] in the 92nd śloka of the Pāṭyadhyāya: (15th adhyāya:), gives the value of π as 22 ÷ 7 (3.142857152), which is nearer to modern value of π (3.141592653...) than that of Śrīdharācārya. Therefore, these orientalists maintain that Śrīdharācārya's Pāṭīgaṇitam is ancient to Mahāryabhaṭṭa Siddhānta:.

If we fix the chronology of the ancient texts in this way, then Āryabhaṭṭīyam of Āryabhaṭṭa would become the latest of all the texts, since it gives the more accurate value of π (3.1416) than other texts and further, it alone mentioned that it is an approximate value, using the word, āsannau – nearer to absolute. The value of π as given in various ancient astronoimical and mathematical texts of our Nation are, Sūrya Siddhānta: = $\sqrt{10}$ (3.1622776),

Śrīdharācārya = $\sqrt{10}$ (3.1622776),

Mahāryabhaṭṭa Siddhānta: = 22 ÷ 7 (3.142857152),
21,600 ÷ 6,876 or
600 ÷ 191 (3.141361256)

Bhāskarācārya (Līlāvatī) = 22 ÷ 7 (3.142857152),
3,927 ÷ 1,250 (3.1416)

Āryabhaṭṭīyam = 62,832 ÷ 20,000 (3.1416 - āsannau – near absolute)

Modern estimation = 3.141592653.....

Based on this, if we try to fix the chronology, then Sūrya Siddhānta: and Śrīdharācārya's Pāṭīgaṇitam would become contemporary and Śrīdharācārya's Pāṭīgaṇitam would be ancient than even Āryabhaṭṭīyam. Then comes Mahāryabhaṭṭa Siddhānta: and the next would be Bhāskarācārya's Līlāvatī and more recent would be Āryabhaṭṭīyam. Obviously, this order is wrong and very confusing. Thus, the chronology arrived with the correctness of formulas and values, does not hold good, independently. We need some more concrete evidences like mentioning of the year, any one epoch, a period, any event or a reign of a king or the name of the other author or the name of other's text, to arrive chronology. Here we find that no author had quoted the other's name or even other's text. In spite of this, the so-called oriental experts with more and more ifs and buts, assumptions and personal views, fixed the chronology of our Nation's ancient texts according to their will and wish unilaterally, despite the fact that Mahāryabhaṭṭa Siddhānta: mentioned very clearly,[34] in the second śloka of second adhyāya: (Pārāśaryamatāntarādhikāra:), that it was written at the very early years of Kailyuga.

Thus, the date of **Mahāryabhaṭṭa Siddhānta: is at the very early years of Kaliyuga** and that of **Āryabhaṭṭīyam is 360 Kali (2741 B.C.E.)** and **both were written by one and the same Āryabhaṭṭa.**

ĀRYABHAṬṬA'S WORKS

1. Āryabhaṭṭīyam, is based on Svāyambuva Siddhānta:[55] which is said to be Paitāmaha Siddhānta:. On writing his commentary on Āryabhaṭṭīyam, Bhāskara named [56] the commentary on Gītikapāda: (1st adhyāya:) as Daśagītika Sūtra Vyākhya and the commentary on the remaining three adhyāyā: as Āryabhaṭṭa Tantra Bhāṣya. Bhāskara mentioned the Daśagītika Sūtra (Gītikapāda: - first adhyāya:) as Tantrāntara or as Sva-tantrāntara. Sūryadeva Yajvā who wrote commentary on Āryabhaṭṭīyam, mentioned Daśagītika Sūtra and Āryabhaṭṭa Tantra as two works.[56] Another commentator, Ragunātha Rāja also made [56] similar statement.

2. Mahāryabhaṭṭa Siddhānta: is based on Parāśara's text

(Pārāśaryam Matam)[35] and Vṛddha Āryabhaṭṭa's text (of Senior Āryabhaṭṭa) of very ancient period (mahākālāt).[40] The exact date of this Vṛddha Āryabhaṭṭa is not yet assessed, due to the non-availability of his text and other details. In these two texts Sunrise day-reckoning at Lanka is used.

3. (Laghu) Āryabhaṭṭa Siddhānta: may be based on Sūrya Siddhānta: and uses the method of midnight day-reckoning at Lanka.[57] This text is so for not traceable.

ĀRYABHAṬṬA'S PLACE

There are various opinions about his place of birth, study or teaching.

1. Kusumapura

As per the śloka already dealt,[1] it is said that Sun God, Sūrya himself appeared as Āryabhaṭṭa at Kusumapura in Kaliyuga. This is further corroborated by the first śloka of Gaṇitapāda: (2nd adhyāya:), of Āryabhaṭṭīyam itself.[58]

ब्रह्म कु शशि बुध भृगु रवि कुज गुरु कोण
भगणान् नमस्कृत्य।
आर्यभट्टस्त्विह निगदति
कुसुमपुरेऽभ्यर्चितं ज्ञानम् ।।

Brahma Ku Śaśi Budha Bhṛgu Ravi Kuja

Guru Koṇa Bhagaṇān namaskṛtya ।

Āryabhaṭṭastviha nigadati Kusumapureऽbhyarcitam

Jñānam ।।

The meaning is, having worshiped Brahma, Earth, Moon, Mercury, Venus, Sun, Mars, Jupiter, Saturn and Asterisms, Āryabhaṭṭa set forth the knowledge honoured at Kusumapura. Based on these two śloka, we can say that the place of birth and study of Āryabhaṭṭa was Kusumapura. Bhāskara in his commentary[32] on Āryabhaṭṭīyam, under the first śloka of Gaṇitapāda: (2nd adhyāya:), mentioned Kusumapura as Pātaliputra (the modern Patna in Bihar).

2. Aśmaka

Bhāskara in his commentary on Āryabhaṭṭīyam,[59] under the śloka 32 and 33 of Gaṇitapāda: (2nd adhyāya:), in the illustrations 8, 10, 17, 18, 20 and 26 and in the śloka 3 and 21 of the 1st adhyāya: of Mahābhāskarīyam,[60] mentioned Aśmaka as a synonym of Āryabhaṭṭa, Āśmaka with a meaning of pertaining to Āryabhaṭṭa,[59] Āśmakīya: meaning a follower of Āryabhaṭṭa[59] and Āśmakīya, Āśmaka - Tantra and Āśmakīya -Śāstra as the text of Āryabhaṭṭa (Āryabhaṭṭīyam).[59] This may mean that Āryabhaṭṭa belonged to Aśmaka, a place in our Nation. There are various opinions on Aśmaka's location.[61] One view is, it is a place in the Northwestern part of our Nation i.e. north-west of Avantī (Ujjain). Another view is it lies between the rivers of Godāvarī and Narmadā, in Mahārāshtra and Indore district of Madhya Predesh. There is another opinion which says that Aśmaka was a country in southern part of our Nation,[62] especially an old name of Travancore (Thiruvanandapuram - Kerala) as per 'The Students Sanskrit English Dictionary' of Śrī Vaman Shivram Apte, page 661, second edition reprint 2000, Motilal Banarsidass.

Further, Aśmaka: was the name of the King of Ayodhyā of Ikshavāku dynasty.[63] He was the nineth descendent after Bhagīratha: and the nineth descendent after him was the highly worshiped Śrī Rāma:. He was the son of Sudāsa and Madayamati. During delivery of the child, Madayamati had to undergo surgical intervention and her womb (uterus) was opened with a surgical instrument called Aśmaka and hence the child was named as Aśmaka.

Even though there are various opinions on Āryabhaṭṭa's place, he certainly belonged to all parts of our Nation and he is definitely a great soul and a great asset to our Nation, even after the lapse of so much time.

ĀRYABHAṬṬA'S PUPILS

Bhāskara in his commentary[31] on Āryabhaṭṭīyam (3-10), mentioned the names of Pāṇḍuraṅgasvāmi, Lāṭadeva and Niśaṅgu amongst the direct pupils of Āryabhaṭṭa. He mentioned Lāṭadeva as Ācārya Lāṭadeva and as Sarva Siddhānta Guru in his commentary [31] on Āryabhaṭṭīyam (3 – 5 & 10). It has been told that Lāṭadeva wrote two astronomical texts, of which one is adopting midnight day-reckoning at Lanka.[31] Lāṭadeva wrote commentaries on Romaka (Lomaka) Siddhānta: and Pauliśa Siddhānta: also. This was stated by Varāhamihira[30] in his Pañca Siddhāntikā, in the 3rd śloka of the 1st Adhyāya: (Karaṇāvatāra:) Others like Bhāskara, Someśvara and Prabhākara were not direct pupils but followed Āryabhaṭṭa system and thereby became his disciples.

COMMENTARIES ON ĀRYABHAṬṬAĪAM

These were written [64] by Bhāskara, Someśvara, Prabhākara, Sūryadeva Yajvā of Gangaikoṇḍa Śozhapuram of Tamilnadu, Parameśvara, Nīlakaṇṭha Somayāji, Raghunātha Rāja, Mādhava son of Virūpākṣa, BhūtiViṣṇu, Ghaṭigopa, Kodaṇḍa Rāma, Virūpākṣa, Kriṣṇadevadāsa and Kriṣṇa. All these commentaries were written in Sanskrit Language only. This shows that the Language Sanskrit was used fluently up to 1600 C.E. and even later, as the date of Raghunātha Rāja is 1597 C.E., and that of Ghaṭigopa is said to be 1810 – 1860 C.E. Ghaṭigopa wrote a commentary in Malaylam also and Kodaṇḍa Rāma wrote a commentary in Telugu. There is an anonymous commentary in Marathi language exists.

WORKS BASED ON ĀRYABHAṬṬAĪAM [65]

1. Śiṣyadhīvṟddhida Tantram of Lāllācārya
2. Bhāskara's Mahābhāskarīyam (Āryabhaṭa Karma Nibhanda:) and Laghubhāskarīyam
3. Karaṉa Ratnam of Devācārya
4. Grahacāra Nibhandana of Haridatta (Haradatta)
5. Karaṉa prakāśa of Brahmadeva
6. Bhaṭṭatulya of Dāmodara
7. Karaṉa paddhati of Putumana Somayāji
8. Āryabhaṭṭa Siddhānta Tulya Karaṉa of Vīrasimhagaṉaka (son of Kāśi Rāja)

TRANSLATION OF ĀRYABHAṬṬĪYAM

Āryabhaṭṭīyam was translated into Arabic under the title Āryabhaṭṭa, misread as Arajbahara or Arojbahaz. [66] Thus, it influenced the other parts of the globe also.

CONCLUSION

Thus, in this 1st book on Āryabhaṭṭa, 1. **The actual date of Āryabhaṭṭa (2764 B.C.E.)** is arrived, based on various strong evidences, 2. It has been shown clearly that Āryabhaṭṭa wrote not only Āryabhaṭṭīyam and (Laghu) Āryabhaṭṭa Siddhānta: (Laghu

Āryabhaṭṭīyam), but also Mahāryabhaṭṭa Siddhānta:, thus **the author of Āryabhaṭṭīyam and Mahāryabhaṭṭa Siddhānta:** were not two different persons but actually **one and the same Āryabhaṭṭa of 2764 B.C.E.** 3. The inconsistency and the hollowness of the wrong views, on his date, name and texts, concocted with the motive of reducing our Nation's antiquity and glorious achievements, are also correctly pointed out. In the next book on Āryabhaṭṭa, his great contributions in the fields of astronomy and mathematics will be discussed.

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From: James Q. Jacobs <jqjacobs@yahoo.com>
To: <mlrsreekrishna@yahoo.com>
Sent: Tue, 5 April, 2011 12:43:51 AM

Subject: Re: Dr.M.L.Raja Astronomical Formulas <mlrsreekrishna@yahoo.com>... wrote: May I ask your permission to use your formulas, with acknowledgement of yourselves as the source, in my teachings and books, please.

You have permission to cite my formulations and spreadsheets, and, if you wish to of course, link to my domain. Keep in mind the formulas have original sources as I cite, and they too should be credited for their efforts. Thank you for your kind feedback. JQ

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Name of Āryabhaṭṭa (a: G. Thibaut's Preface to Pñcha Siddhāntikā of Varāhamihira Ref. Page 8 of this book

PREFACE.

There is some reason to fear that the feeling of any one who may examine in detail this edition and translation of Varâha Mihira's astronomical work will, in the first place, be wonder at the boldness of the editors. I am indeed fully conscious that on the imperfect materials at our disposal an edition in the strict sense of the word cannot be based, and that what we are able to offer at present deserves no other name but that of a first attempt to give a general idea of the contents of the Pañchasiddhântikâ. It would, in these circumstances, possibly have been wiser to delay an edition of the work until more correct Manuscripts have been discovered. Two considerations, however, in the end induced us no longer to keep back the results, however imperfect, of our long continued endeavours to restore and elucidate the text of the Pañchasiddhântikâ. In the first place we were encouraged by the consideration that texts of purely mathematical or astronomical contents may, without great disadvantages, be submitted to a much rougher and bolder treatment than texts of other kinds. What interests us in these works, is almost exclusively their matter, not either their general style or the particular words employed; and the peculiar nature of the subject often enables us to restore with nearly absolute certainty the general meaning of passages the single words of which are past trustworthy emendation. And, in the second place, we feel convinced that even from that part of the Pañchasiddhântikâ which we are able to explain more is to be learned about the early history of Sanskrit Astronomy than from any other work which has come down to our time.

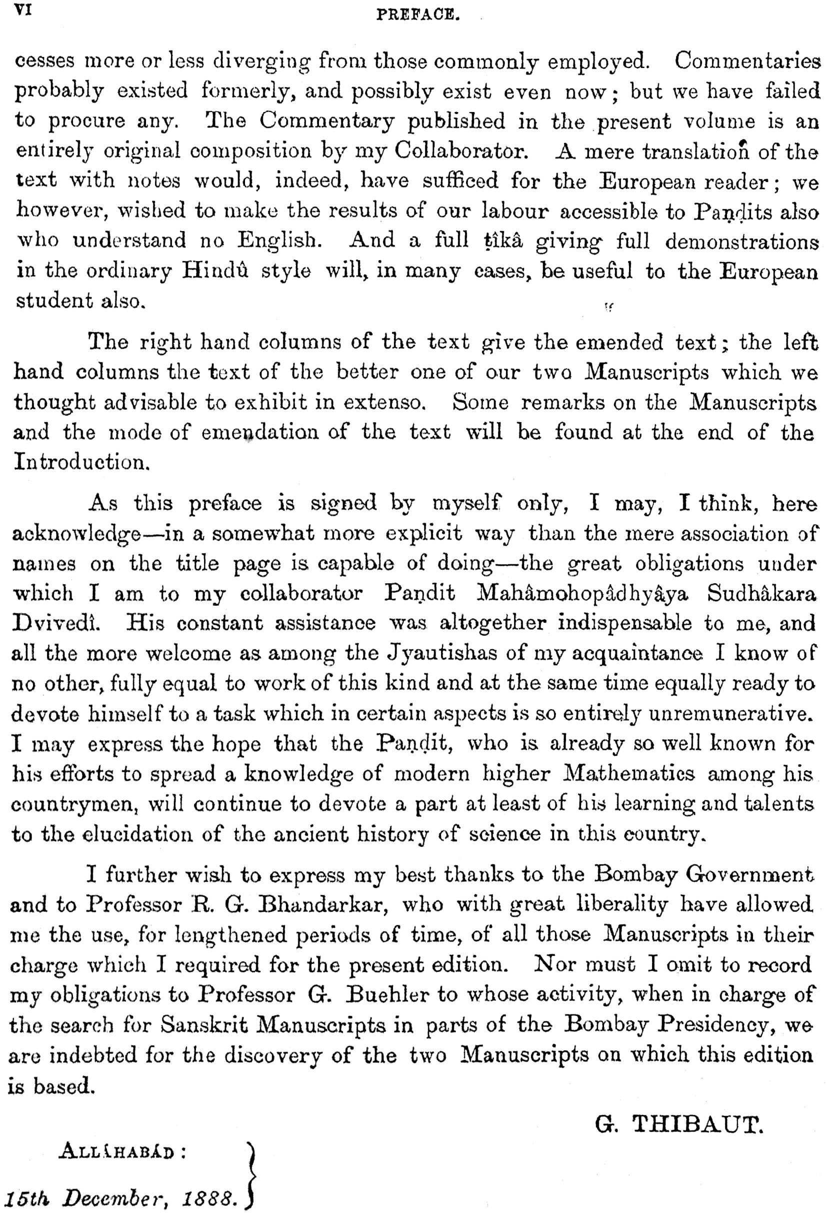
Imperfect and fragmentary as text and translation are, we may assert at any rate that, in our endeavours to overcome the quite unusual obstacles, which the corrupt and bare text of the Pañchasiddhântikâ opposes to the interpreter, we have spared no trouble. The time and thought, devoted to the present volume, would, I may say without exaggeration, have amply sufficed for the editing and explaining of twenty times the amount of text presenting only normal difficulties. This I mention, not of course in order to extol what we have been able to do, but only as an excuse for what we see ourselves obliged to leave undone.

Next to the lamentable state of the text as appearing in the two Manuscripts at our disposal, the greatest disadvantage under which we laboured was the absence of a Commentary. Commentaries can be hardly done without in the case of any Sanskrit astronomical work; much less so, when the text, as that of the Pañchasiddhântikâ, describes many mathematical pro-

DATE OF ĀRYABHAṬṬA

Read 10th to 12th Lines of this scanned copy of

G. Thibaut's Preface dated 15th December, 1888



cesses more or less diverging from those commonly employed. Commentaries probably existed formerly, and possibly exist even now; but we have failed to procure any. The Commentary published in the present volume is an entirely original composition by my Collaborator. A mere translation of the text with notes would, indeed, have sufficed for the European reader; we however, wished to make the results of our labour accessible to Paṇḍits also who understand no English. And a full ṭîkâ giving full demonstrations in the ordinary Hindû style will, in many cases, be useful to the European student also.

The right hand columns of the text give the emended text; the left hand columns the text of the better one of our two Manuscripts which we thought advisable to exhibit in extenso. Some remarks on the Manuscripts and the mode of emendation of the text will be found at the end of the Introduction.

As this preface is signed by myself only, I may, I think, here acknowledge—in a somewhat more explicit way than the mere association of names on the title page is capable of doing—the great obligations under which I am to my collaborator Paṇḍit Mahâmohopâdhyâya Sudhâkara Dvivedî. His constant assistance was altogether indispensable to me, and all the more welcome as among the Jyautishas of my acquaintance I know of no other, fully equal to work of this kind and at the same time equally ready to devote himself to a task which in certain aspects is so entirely unremunerative. I may express the hope that the Paṇḍit, who is already so well known for his efforts to spread a knowledge of modern higher Mathematics among his countrymen, will continue to devote a part at least of his learning and talents to the elucidation of the ancient history of science in this country.

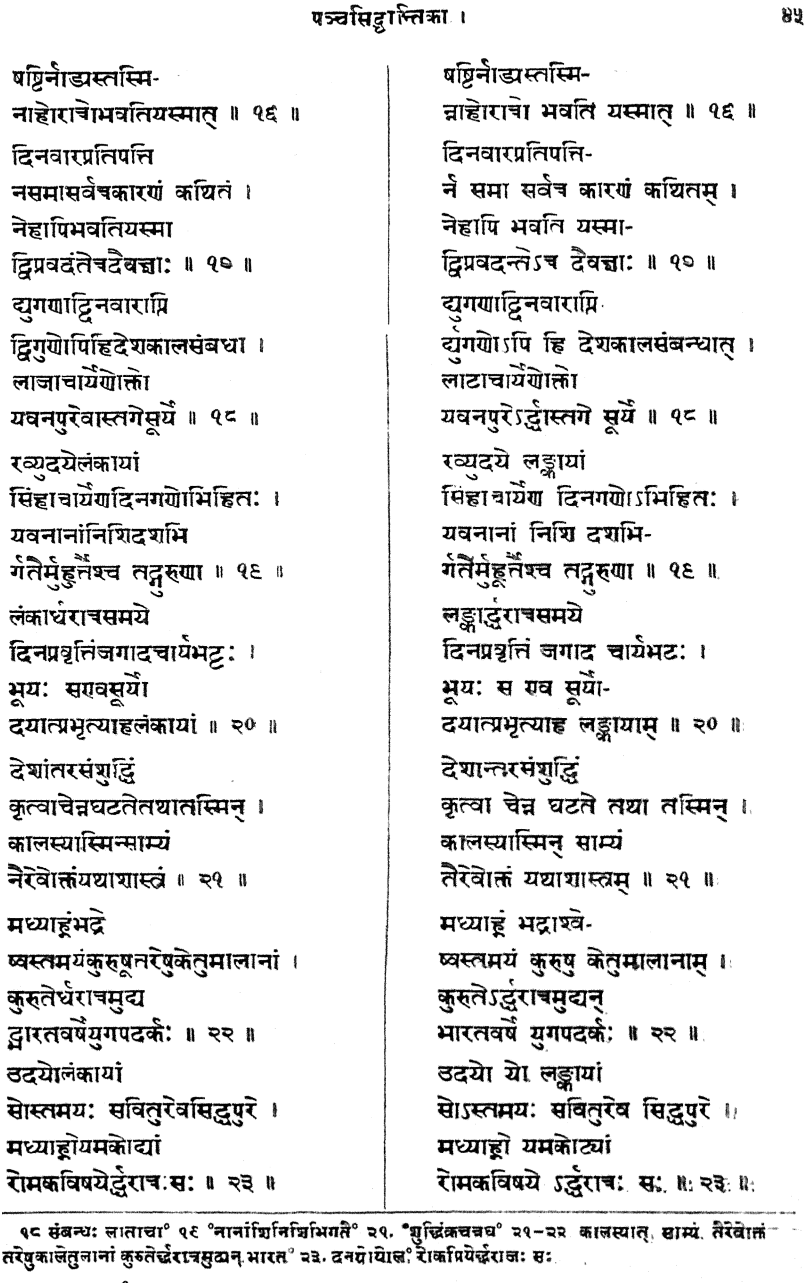
I further wish to express my best thanks to the Bombay Government and to Professor R. G. Bhandarkar, who with great liberality have allowed me the use, for lengthened periods of time, of all those Manuscripts in their charge which I required for the present edition. Nor must I omit to record my obligations to Professor G. Buehler to whose activity, when in charge of the search for Sanskrit Manuscripts in parts of the Bombay Presidency, we are indebted for the discovery of the two Manuscripts on which this edition is based.

G. THIBAUT.

Allâhabâd:
15th December, 1888.

DATE OF ĀRYABHAṬṬA

Pañcha Siddhāntikā of Varāhamihira edited by G. Thibaut & Sudhakara Dvivedi, 20th śloka of 15th Adhyāya :(Ref. Page 8) Name of Āryabhaṭṭa, Discrepancy in Left & Right Columns



पञ्चसिद्धान्तिका । ४५

षष्टिर्नाड्यस्तस्मि-	षष्टिर्नाड्यस्तस्मि-
नाहोरात्रोभवतियस्मात् ॥ १६ ॥	न्नाहोरात्रो भवति यस्मात् ॥ १६ ॥
दिनवारप्रतिपत्ति	दिनवारप्रतिपत्ति-
नसमासर्वत्रकारणं कथितं ।	र्न समा सर्वत्र कारणं कथितम् ।
नेहापिभवतियस्मा	नेहापि भवति यस्मा-
द्विप्रवदंतेत्रदैवज्ञाः ॥ १७ ॥	द्विप्रवदन्तेऽत्र दैवज्ञाः ॥ १७ ॥
द्युगणाद्दिनवाराप्ति	द्युगणाद्दिनवाराप्ति
द्विगुणोपिहिदेशकालसंबधा ।	र्द्युगणोऽपि हि देशकालसंबन्धात् ।
लाजाचार्येणोक्तो	लाटाचार्येणोक्तो
यवनपुरेवास्तगेसूर्ये ॥ १८ ॥	यवनपुरेऽर्द्धास्तगे सूर्ये ॥ १८ ॥
रव्युदयेलंकायां	रव्युदये लङ्कायां
सिंहाचार्येणदिनगणोभिहितः ।	सिंहाचार्येण दिनगणोऽभिहितः ।
यवनानांनिशिदशभि	यवनानां निशि दशभि-
र्गतैर्मुहुर्तैश्च तद्गुरुणा ॥ १९ ॥	र्गतैर्मुहूर्तैश्च तद्गुरुणा ॥ १९ ॥
लंकार्धरात्रसमये	लङ्कार्द्धरात्रसमये
दिनप्रवृत्तिंजगादचार्यभट्टः ।	दिनप्रवृत्तिं जगाद चार्यभटः ।
भूयः सएवसूर्यो	भूयः स एव सूर्यो-
दयात्प्रभृत्याहलंकायां ॥ २० ॥	दयात्प्रभृत्याह लङ्कायाम् ॥ २० ॥
देशांतरसंशुद्धिं	देशान्तरसंशुद्धिं
कृत्वाचेन्नघटतेतथातस्मिन् ।	कृत्वा चेन्न घटते तथा तस्मिन् ।
कालस्यास्मिन्साम्यं	कालस्यास्मिन् साम्यं
नैरेवोक्तंयथाशास्त्रं ॥ २१ ॥	तैरेवोक्तं यथाशास्त्रम् ॥ २१ ॥
मध्याह्नंभद्रे	मध्याह्नं भद्राश्वे-
ष्वस्तमयंकुरुषूतरेषुकेतुमालानां ।	ष्वस्तमयं कुरुषु केतुमालानाम् ।
कुरुतेर्धरात्रमुद्य	कुरुतेऽर्द्धरात्रमुद्यन्
द्भारतवर्षेयुगपदर्कः ॥ २२ ॥	भारतवर्षे युगपदर्कः ॥ २२ ॥
उदयोलंकायां	उदयो यो लङ्कायां
सोस्तमयः सवितुरेवसिद्धपुरे ।	सोऽस्तमयः सवितुरेव सिद्धपुरे ।
मध्याह्नोयमकोद्यां	मध्याह्नो यमकोट्यां
रोमकविषयेर्द्धरात्रःसः ॥ २३ ॥	रोमकविषयेऽर्द्धरात्रः सः ॥ २३ ॥

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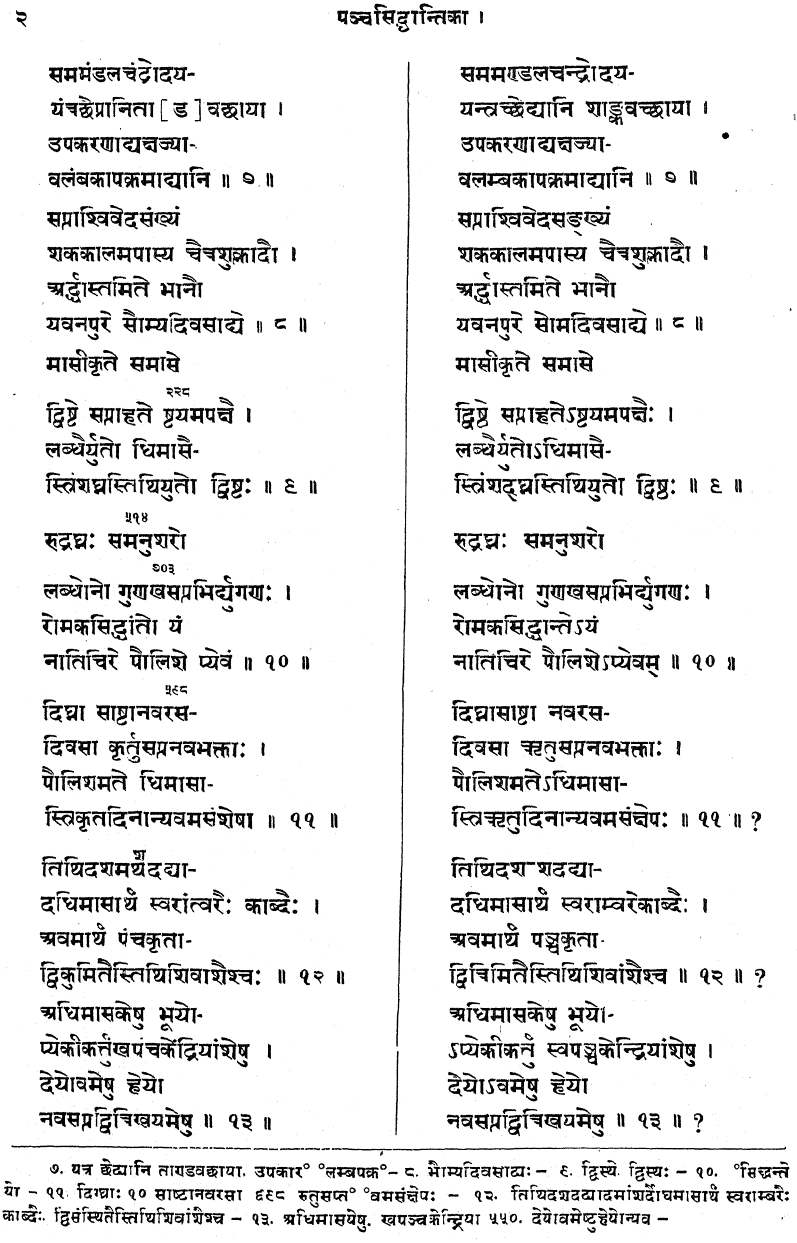
१८ संबन्धः लाताचा° १९ °नानांशिनिशिभिगतै° २१. °शुद्धिंकृत्वचघ° २१–२२ कालस्यात्, साम्यं, तैरेवोक्तं तरेषुकालेतुलानां कुरुतेर्द्धरात्रमुद्यन् भारत° २३. दनयोयोल° रोकप्रियेर्द्धरात्रः सः

DATE OF ĀRYABHAṬṬA

Pañcha Siddhāntikā of Varāhamihira edited by G. Thibaut & Sudhakara Dvivedi, 8th śloka of 1st Adhyāya : Chowkhamba Sanskrit Series Office, Varanasi (Ref. Page 33 of this book)



२ पञ्चसिद्धान्तिका ।

सममंडलचंद्रोदय-
यंचछेद्यानिता [ड] वच्छाया ।
उपकरणाद्यन्तज्या-
वलंबकापक्रमाद्यानि ॥ ७ ॥

सप्ताश्विवेदसंख्यं
शककालमपास्य चैत्रशुक्लादौ ।
अर्द्धास्तमिते भानौ
यवनपुरे सौम्यदिवसाद्ये ॥ ८ ॥

मासीकृते समासे
२२८
द्विष्टे सप्ताहते ष्टयमपक्षै ।
लब्धैर्युतो धिमासै-
स्त्रिंशघ्नस्तिथियुतो द्विष्टः ॥ ९ ॥

५१४
रुद्रघ्नः समनुशरो
१०३
लब्धोनो गुणखसप्तभिर्द्युगणः ।
रोमकसिद्धांतो यं
नातिचिरे पौलिशे प्येवं ॥ १० ॥

५९८
दिघ्ना साष्टानवरस-
दिवसा कृतुसप्तनवभक्ताः ।
पौलिशमते धिमासा-
स्त्रिकृतदिनान्यवमसंशेषा ॥ ११ ॥

ग
तिथिदशमर्थदद्या-
दधिमासार्थं स्वरांत्वरैः काब्दैः ।
अवमार्थं पंचकृता-
द्विकुमितैस्तिथिशिवाशैश्चः ॥ १२ ॥

अधिमासकेषु भूयो-
प्येकीकर्त्तुंखपंचकेंद्रियांशेषु ।
देयोवमेषु हेयो
नवसप्तद्विचिखयमेषु ॥ १३ ॥

सममण्डलचन्द्रोदय-
यन्त्रच्छेद्यानि शाङ्कवच्छाया ।
उपकरणाद्यन्तज्या-
वलम्बकापक्रमाद्यानि ॥ ७ ॥

सप्ताश्विवेदसङ्ख्यं
शककालमपास्य चैत्रशुक्लादौ ।
अर्द्धास्तमिते भानौ
यवनपुरे सौमदिवसाद्ये ॥ ८ ॥

मासीकृते समासे
द्विष्ठे सप्ताहतेऽष्टयमपक्षैः ।
लब्धैर्युतोऽधिमासै-
स्त्रिंशद्घ्नस्तिथियुतो द्विष्ठः ॥ ९ ॥

रुद्रघ्नः समनुशरो
लब्धोनो गुणखसप्तभिर्द्युगणः ।
रोमकसिद्धान्तेऽयं
नातिचिरे पौलिशेऽप्येवम् ॥ १० ॥

दिघ्नासाष्टा नवरस-
दिवसा ऋतुसप्तनवभक्ताः ।
पौलिशमतेऽधिमासा-
स्त्रिऋतुदिनान्यवमसंक्षेपः ॥ ११ ॥ ?

तिथिदश शदद्या-
दधिमासार्थं स्वराम्वरैकाब्दैः ।
अवमार्थं पञ्चकृता-
द्विचिमितैस्तिथिशिवांशैश्च ॥ १२ ॥ ?

अधिमासकेषु भूयो-
ऽप्येकीकर्त्तुं स्वपञ्चकेन्द्रियांशेषु ।
देयोऽवमेषु हेयो
नवसप्तद्विचिखयमेषु ॥ १३ ॥ ?

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७. यत्र छेद्यानि ताराडवच्छाया. उपकार° °लम्बपक्र°– ८. भौम्यदिवसाद्यः – ९. द्विस्थे. द्विस्थः – १०. °सिद्धन्ते यो – ११. दिग्घाः १० साष्टानवरसा ९९८ रुतुसप्त° °वमसंक्षेपः – १२. तिथिदशदद्यादमांशर्दोघमासार्थं स्वराम्बरैः काब्दैः. द्विसंस्थितैस्तिथिशिवांशैश्च – १३. अधिमासयेषु. खपञ्चकेन्द्रिया ५५०. देयोवमेष्टुहेयोन्यव –

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This book on is one of his research work, where the actual date of Aryabhatta i.e. 2764 B.C.E. (4774 years before present) has been established on concrete and conclusive evidences. Besides, this book also proves, by producing concrete and corroborative evidences, that Aryabhatta wrote not only Aryabhattiyam and (Laghu) Aryabhatta Siddhanta (Laghu Aryabhattiyam), but also Maharyabhatta Siddhanta, the ancient astronomical and mathematical text of our Nation, thus clearly pointing out that the author of Aryabhattiyam and Maharyabhatta Siddhanta were not two different persons but actually one and the same Aryabhatta of 2764 B.C.E.

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